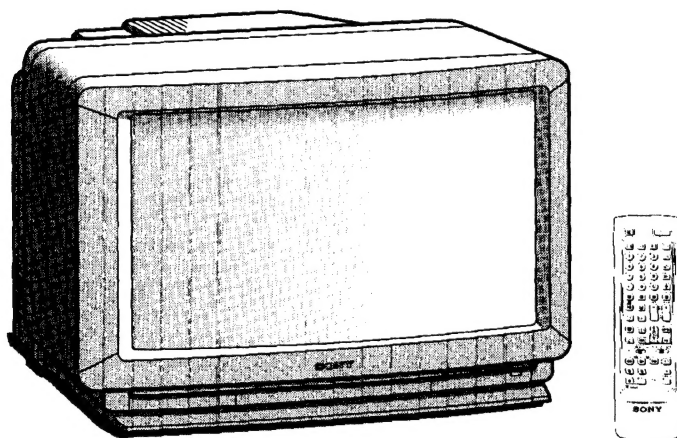


SERVICE MANUAL

AE-2F CHASSIS

FL	COMMANDER	DEST.	CHASSIS NO.
I-W3213	RM-842	AEP	SCC-G72E-A
I-W3212U	RM-842	UK	SCC-G88C-A



TRINITRON® COLOUR TV
SONY®

ITEM MODEL	Television system	Stereo system	Channel coverage	Color system
AEP	B/G/H,D/K L, I	GERMAN/NICAM Stereo	L VHF:F02-F10 UHF:F21-F60 CABLE TV: B-Q B/G/H VHF:E2-E12 UHF:E21-E69 CABLE TV (1): S1-S41 CABLE TV (2): S01-S05, M1-M10, U1-U10 ITALIA VHF:A-H2 D/K VHF:R01-R12 UHF:R21-R69 I UHF:B21-B69	PAL,SECAM NTSC3.58/4.43 (VIDEO IN)
UK	I	NICAM Stereo	UHF : B21-B69	PAL,SECAM NTSC3.58/4.43 (VIDEO IN)

MODEL	AEP	UK
Power consumption	176W	237W

Specifications

Picture tube Super Trinitron
Approx. 79 cm (32 inches)
(Approx. 76 cm picture measured diagonally)
110° -deflection

Input/Output Terminals

[REAR]

- ① 1 21-pin Euro connector (CENELEC standard)
 - Inputs for audio and video signals
 - inputs for RGB
 - outputs of TV video and audio signals
- ② 2 21-pin Euro connector
 - inputs for audio and video signals
 - inputs for S video
 - outputs for audio and video signals (selectable)
- ④ 4 21-pin Euro connector
 - inputs for audio and video signals
 - inputs for S video
 - outputs for audio and video signals (monitor out)
- ②, ④ 4 S video inputs
 - 4 pin DIN
- ② Audio inputs (L, R) -phono jacks
- ② S video output - 4 pin DIN
- ② Audio outputs - phono jacks
- ② Audio outputs (variable) - phono jacks
- ③ 3 Video input-phono jack
- ② Audio input-phono jacks
- ③ 3 S video input 4-pin DIN

[FRONT]

Ω Headphone jack: Stereo minijack

Sound output 2x25W (Music power)
Dimensions incl.speakers Approx. 905 x 600 x 581 mm
Weight Approx. 72 kg
Supplied accessories RM-842 Remote Commander (1)
RM-860 Scroll Commander (1)
IEC designation R6 batteries (3)
Other features Digital comb filter (High resolution)
Multi-PIP (Picture-in picture)
PIP plus
PAL plus
Scroll Commander
NICAM
FASTTEXT
DNR (Digital Noise Reduction)
100 Hz Digital Plus
Digital Surround Sound
Graphic Equalizer

[RM-842]



Remote control system infrared control
Power requirements 3V dc
2 batteries IEC designation R6 (size AA)
Dimensions Approx. 65 x 222 x 21 mm (w/h/d)
Weight Approx. 157g (Not including Batteries)

Design and specifications are subject to change without notice.

Model name	KV-W3213	KV-W3212U
Item		
Pal Comb	ON	ON
PiP	ON	ON
RGB Priority	ON	ON
Equalizer/DSP	ON	ON
NICAM	ON	ON
Scart 1	ON	ON
Scart 2	ON	ON
Front in (3)	ON	ON
Scart 4	ON	ON
Projector	OFF	OFF
AKB in 16:9 mode	ON	ON
Norm B/G	ON	OFF
Norm I	ON	ON
Norm D/K	ON	OFF
Norm AUS	OFF	OFF
Norm L	ON	OFF
Norm SAT	OFF	OFF
Norm M	OFF	OFF
Language Preset	AEP	UK

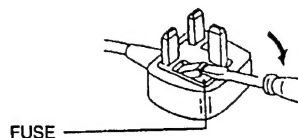
WARNING KV-W3212U only

A moulded plug complying with BS 1363 is fitted to this equipment for your safety and convenience.

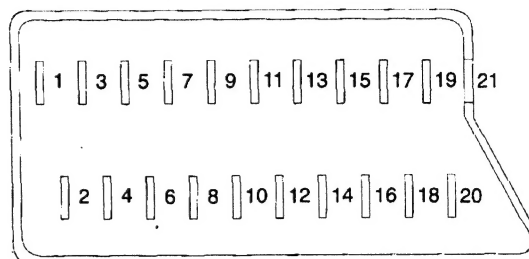
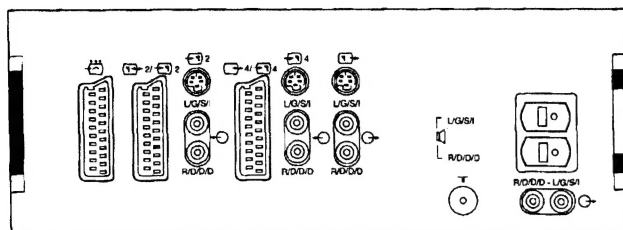
Should the fuse in the plug supplied need to be replaced, a 5 AMP fuse approved by ASTA or BSI to BS 1362 (i.e. marked with  or  must be used.

When an alternative type of plug is used it should be fitted with a 5 AMP FUSE at the distribution board.

If the plug supplied with this equipment has a detachable fuse cover, be sure to attach the fuse cover after you change the fuse. Never use the plug without the fuse cover. If you should lose the fuse cover, please contact your nearest Sony service station.



21 pin connector (1 G-2 / G-4)



Pin No	1	2	Signal	Signal level
1	○	○	Audio output B (right)	Standard level: 0.5Vrms Output impedance: less than 1kohm*
2	○	○	Audio input B (right)	Standard level: 0.5Vrms Input impedance: More than 10kohms*
3	○	○	Audio output A (left)	Standard level: 0.5Vrms Output impedance: less than 1kohm*
4	○	○	Ground (audio)	
5	○	○	Ground (blue)	
6	○	○	Audio input A (left)	Standard level: 0.5Vrms Input impedance: More than 10kohms*
7	○	●	Blue input	0.7V±3dB, 75ohms, positive
8	○	○	Function select (AV control)	High state (9.5—12V): Part mode Low state (0—2V): TV mode Input impedance: More than 10kohms Input capacitance: Less than 2nF
9	○	○	Ground (green)	
10	○	○	Open	
11	○	●	Green	Green signal: 0.7V±3dB. 75ohms, positive
12	○	○	Open	
13	○	○	Ground (red)	
14	○	○	Ground (blanking)	
15	○	—	Red input	0.7V±3dB, 75ohms, positive
	—	○	(S signal) chroma input	0.3V±3dB, 75ohms, positive
16	○	●	Blanking input (Ys signal)	High state (1—3V) Low state (0—0.4V) Input impedance: 75ohms
17	○	○	Ground (video output)	
18	○	○	Ground (video input)	
19	○	○	Video output	1V±3dB, 75ohms, positive Sync: 0.3V(-3, +10dB)
20	○	—	Video input	1V±3dB, 75ohms, positive Sync: 0.3V(-3, +10dB)
	—	○	Video Input/Y (S signal)	1V±3dB, 75ohms, positive Sync: 0.3V(-3, +10dB)
21	○	○	Common ground (plug, shield)	

○ connected

● unconnected (open)

* At 20 Hz—20kHz

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Titl</u>	<u>Page</u>
1. GENERAL			5. DIAGRAMS		
	Overview	6	5-1. Block Diagrams (1)		39
	Step 1 Preparation	7	Block Diagrams (2)		41
	Step 2 Connection	7	Block Diagrams (3)		43
	Step 3 Tuning in to TV stations	7	Block Diagrams (4)		45
	Additional Presetting Functions	9	Block Diagrams (5)		47
	Watching the TV	10	Block Diagrams (6)		51
	Adjusting and Setting the TV using the Menu	11	Block Diagrams (7)		52
	PIP (Picture in Picture)	13	Block Diagrams (8)		53
	Teletext	14	Block Diagrams (9)		54
	Connecting and Operating Optional Equipment	16	Block Diagrams (10)		55
	For Your Information	18	Block Diagrams (11)		56
			Block Diagrams (12)		57
2. DISASSEMBLY			5-2. Circuit Boards Location		59
2-1. Rear Cover Removal		19	5-3. Schematic Diagrams and Printed Wiring Boards		59
2-2. Chassis Assy Removal		19	* A Board		63
2-3. Speaker Removal		20	* J Board		69
2-4. Service Position		20	* A2 Board		77
2-5. J Board Removal		21	* D Board		82
2-6. G Board Removal		21	* B Board		89
2-7. Q and M3 Boards Removal		22	* Q Board (1/4)		94
2-8. Extension Board		22	* Q Board (2/4)		97
2-9. Wire Dressing		23	* Q Board (3/4)		99
2-10. Degaussing Coil Removal		23	* Q Board (4/4)		101
2-11. Picture Tube Removal		24	* G Board		111
3. SET-UP ADJUSTMENTS			* F1 Board		113
3-1. Beam Landing		25	* C Board		115
3-2. Convergence		26	* M3 Board		119
3-3. Focus		29	* D6 Board		122
3-4. Screen (G2), White Balance		29	* VM Board		123
4. CIRCUIT ADJUSTMENTS			* B2 Board		126
4-1. Electrical Adjustments		30	* D1 Board		129
4-2. Volume Electrical Adjustments		34	* H1, H2, H5 Board		131
4-3. Test Mode 2 :		35	* H3, H4, H6 Board		132
4-4. Error Message		37	* IFH-389FX Board		134
4-5. Error II C Bus Diagnostic System in AE-2F Chassis .		37	5-4. Semiconductors		137
			6. EXPLODED VIEWS		
			6-1. Rear Cover and Speaker		141
			6-2. Picture Tube		142
			6-3. Bezel		143
			6-4. Chassis		144
			7. ELECTRICAL PARTS LIST		145

CAUTION


SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.

THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.


ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET PAR UNE MARQUE  SUR LES VUES EXPLOSÉES ET LES LISTES DE PIÈCES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÈCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

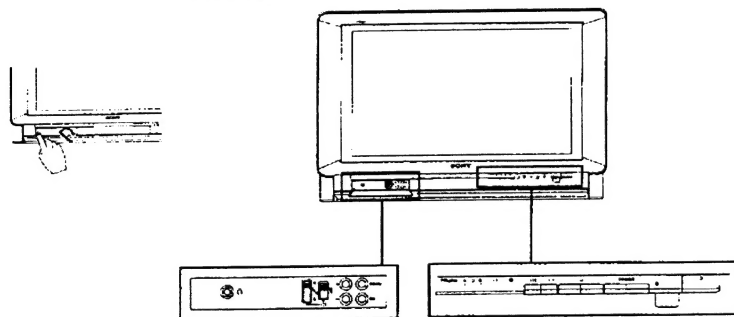
Overview

SECTION 1 GENERAL

The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.

This section briefly describes the buttons and controls on the TV set and on the Remote Commander. For more information, refer to the pages given next to each description.

TV set - front

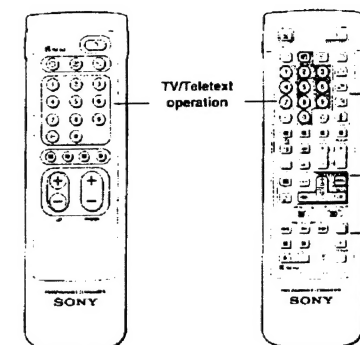


Symbol	Name	Refer to page
⏻	Main power switch	37
PROGR +/-	Programme selectors	43
Δ+/-	Volume control buttons	43
○/□	Input mode selector	44
⏏	Picture size selector	44
Ⓢ	Lights up when the TV is switched on.	—
Ⓢ	Standby indicator	43
A-CD-B	Stereo A/B mode indicator	45
PALplus	PALplus input indicator	—
MENU	Menu on/off button	37
OK	OK (confirming) button	37
Δ+/-	Menu select buttons	37
⏏	Picture rotation adjustment selectors	43
🔊	Headphones jack	54

Scroll Commander RM-860



Remote Commander RM-842



Simple side

TV/Teletext operation

PIP operation

Menu operation

Video operation

Note
The SAT button does not operate with this TV.

TV/Teletext operation

Symbol	Name	Refer to Page
⏻	Mute on/off button	44
⏻	Standby button	43
Ⓢ	TV power on/TV mode selector button	43
Ⓢ	Teletext button	44
Ⓢ	Input mode selector	44
Ⓢ	Output mode selector	55
1,2,3,4,5,6,7,8,9, and 0	Number buttons	43
Δ+/-	Double-digit entering button	43
C	Direct channel entering button	40
Δ+/-	Volume control button	43
PROGR +/-	Programme selectors	43
⏏	Teletext page access buttons	51
⏏	Picture adjustment button	45
⏏	Sound adjustment button	45
⏏	On-screen display button	44
⏏	Teletext hold button	51
⏏	Time display button	44
⏏	Fastest buttons	51
⏏	'Freeze' button	44
⏏	Button to change Screen Format	44

PIP (Picture-in-picture) operation

Symbol	Name	Refer to Page
Ⓢ	PIP on / off button	48
Ⓢ	PIP source selector	48
Ⓢ	Swap button	48
Ⓢ	PIP position changing button	48

Menu operation

Symbol	Name	Refer to Page
MENU	Menu on / off button	37
Δ+/-	Select buttons	37
OK	OK (confirming) button	37
⏏	Back button	37
⏏	Scroll Commander: Roller to select/confirm menu functions	37

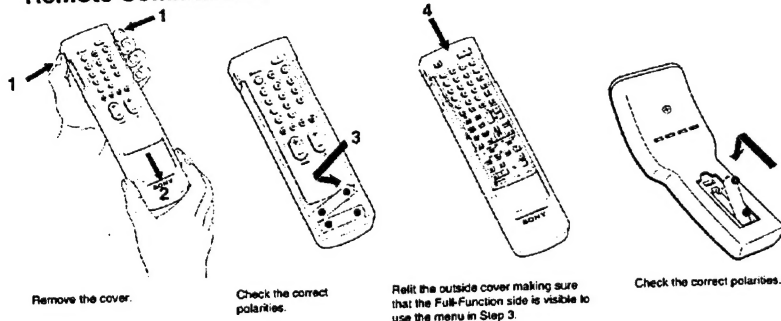
Video operation

Symbol	Name	Refer to Page
MEM USE	MEM/USE Switch	57
MEM	MEM indicator	57
VTR1/2/3	Video equipment selector	57
MDP		
⏏	Video equipment operation buttons	57
PROGR +/-		
RESET	Reset button	57

Getting Started

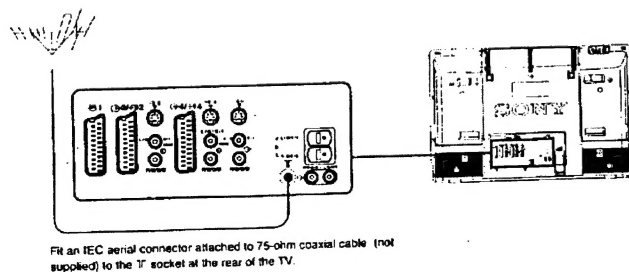
Step 1 Preparation

Insert the batteries into the Remote Commanders

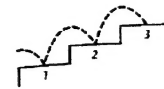


Step 2 Connection

Connect the aerial



Step 3 Tuning in to TV Stations



1 Choose a language

- Depress \square on the TV.
The TV will switch on. If the standby indicator on the TV is lit, press \square or a number button on the Remote Commander.
- Press the MENU button.
The LANGUAGE menu appears. (See Fig. 1)
- Select the language you want with $\Delta+$ or $\Delta-$, and then press OK.

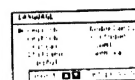


Fig. 1.

2 Display the Menu

Press the \leftarrow button.
The main menu appears. (See Fig. 2)
Now, choose one of the methods described overleaf:
"Preset Channels Automatically"
or
"Preset Channels Manually".

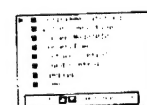


Fig. 2.

Once you have set up the TV, you can choose the language of the menu. Then you should preset the channels (up to 100 channels) by choosing either the automatic or manual method. The automatic method is easier if you want to preset all receivable channels at once. Use the manual method if you only have a few channels and want to preset channels one by one. The manual method is also convenient for allocating programme numbers to various video input sources.

Before you begin

- Check that the Full-Function side of the Remote Commander is visible.
- Locate Menu operation buttons on the Remote Commander. They are shaded in the illustration at the left.

Easy Menu operation using the Scroll Commander

In addition to our double-sided Remote Commander, your TV set is supplied with an extra Remote Commander. The "Scroll Commander" works with a roller for convenient, fast-access operation of the menu functions. Move the roller upwards to move the cursor upwards, move the roller downwards to move the cursor downwards, press the roller to confirm a selection. The other buttons on this commander have the same functions as the respective buttons on the double-sided Remote Commander.



To go back to main menu:
Keep pressing \leftarrow .

To go back to the normal TV picture:
Press MENU. Normal TV picture will be restored after one minute if menu functions are not selected.

Note on the Demo function:
If you choose Demo on the main menu, you can see a sequential demonstration of the menu functions. Press MENU to stop the function.

With this method, you can preset all receivable channels at once.

To stop automatic channel presetting: Press \leftarrow on the Remote Commander.

Notes:
• After presetting the channels automatically, you can check which channels are stored on which programme positions. For details, see "Displaying the Programme Table" on page 44.

• You can sort the programme positions to have them appear on screen in the order you like. For details, see "Sorting the Programme Positions" on page 40.

Note:
Programme names are automatically taken from Teletext if available. If not, please refer to page 41 "Captioning a Station name" for more information.

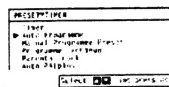
Use this method if there are only a few channels in your area to preset or if you want to preset channels one by one. You may also allocate programme numbers to various video input sources.

If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to main menu:
Keep pressing \leftarrow .
To go back to the normal TV picture:
Press MENU.

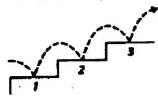
3 Preset channels automatically

- 1 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears. (See Fig. 3.)
- 2 Select Auto Programme with Δ or ∇ and press OK. The AUTO PROGRAMME menu appears. (See Fig. 4.)
- 3 Press OK.
- 4 Select if necessary the TV broadcast system with Δ or ∇ and press OK. The first element of the "PROG" number will be highlighted.
- 5 Select the programme (number button) from which you want to start presetting. Select the first element of the double-digit number with Δ or ∇ or the number buttons (e.g. For "04", select "0" here) and press OK. The second element of "PROG" will be highlighted.
- 6 Select the second element of the double-digit number with Δ or ∇ or the number buttons (e.g. For "04", select "4" here) and press OK. (See Fig. 5.)
- 7 Select "C" or "S" with Δ or ∇ and press OK. The automatic channel presetting starts.

When presetting is finished, the preset menu reappears. All available channels are now stored on successive number buttons. (Press menu to restore normal TV picture).



Additional Presetting Functions

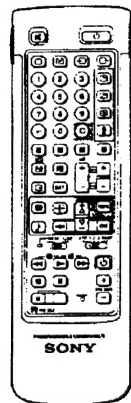


This section shows you additional presetting functions such as sorting or skipping programme positions, captioning a station name, manual fine-tuning, and using the parental lock.

Before you begin

- Check that the Full Function side of the Remote Commander is visible
- Locate the Menu operation buttons.

PROGRAMME SORTING



Sorting Programme Positions

With this function, you can sort the programme positions to a preferable order.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Programme Sorting with Δ or ∇ and press OK. The PROGRAMME SORTING menu appears. (See Fig. 14.)
- 4 Using Δ or ∇ , select the programme position which you want to move to another and press OK. The colour of the selected position changes. (See Fig. 15.)
- 5 Using Δ or ∇ , select the programme position to which you want to move the channel of the programme position selected in step 4 and press OK. Now the programme positions have been sorted. (See Fig. 16.)
- 6 Repeat steps 4 and 5 to sort other programme positions.

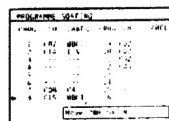


Fig. 14.

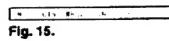


Fig. 15.

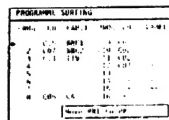


Fig. 16.

Tuning in a Channel Temporarily

You can tune in a channel temporarily, even when it has not been preset. Use the buttons on the Full-Function side of the Remote Commander.

- 1 Press C on the Remote Commander. For cable channels, press C twice. The indication "C" ("S" for cable channels) appears on the screen.
- 2 Enter the double-digit channel number using the number buttons (e.g. for channel 4, first press 0, then 4). The channel appears. However, the channel will not be stored.

For higher programme positions:
The display scrolls automatically.

If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to main menu:
Keep pressing \leftarrow .
To go back to the normal TV picture:
Press MENU.

MANUAL PROGRAMME PRESET

Skipping Programme Positions

You can skip unused programme positions when selecting programmes with the PROG \pm buttons. However, the skipped programmes may still be called up when you use the number buttons.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Manual Programme Preset with Δ or ∇ and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 17.)
- 4 Using Δ or ∇ , select the programme position which you want to skip and press OK. The "SYSTEM" position changes colour. (See Fig. 18.)
- 5 Press Δ or ∇ until --- appears in the SYSTEM position. (See Fig. 18.)
- 6 Press OK. (See Fig. 19.)
- 7 Repeat steps 4 to 6 to skip other programme positions.

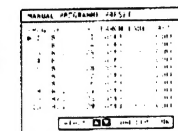


Fig. 17.

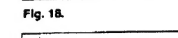


Fig. 18.

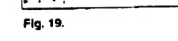


Fig. 19.

MANUAL PROGRAMME PRESET

Captioning a Station Name

Programme names are usually automatically taken from Teletext if available. You can also "name" a channel or an input video source using up to five characters (letters or numbers) to be displayed on the TV screen (e.g. BBC1). Using this function, you can easily identify which channel or video source you are watching.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Manual Programme Preset with Δ or ∇ and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 20.)
- 4 Using Δ or ∇ , select the programme position you want to caption and press OK repeatedly until the first element of the LABEL position is highlighted.
- 5 Select a letter or number with Δ or ∇ and press OK. The next element will be highlighted. Select other characters in the same way. If you want to leave an element blank, select - and press OK. (See Fig. 21.)
- 6 After selecting all the characters, press OK repeatedly until the cursor appears by the next programme position (at the left margin). Now the caption you chose is stored. (See Fig. 22.)
- 7 Repeat steps 5 and 6 to caption names for other channels.

If you have made a mistake:
Press \leftarrow to go back to the previous position.
To go back to main menu:
Keep pressing \leftarrow .

To go back to the normal TV picture:
Press MENU.

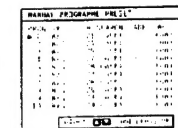


Fig. 20.

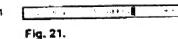


Fig. 21.

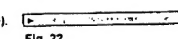
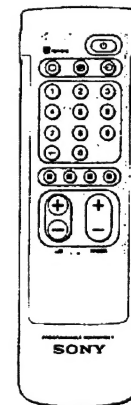


Fig. 22.

Operating Instructions

Watching the TV



If no picture appears when you depress \odot on the TV and if the standby indicator on the TV is lit, the TV is in standby mode. Press \square or one of the number buttons to switch it on.

This section explains the basic functions you use while watching TV. Most of the operations can be done using the simple side of the Remote Commander.

Switching the TV on and off

Switching on

Depress \odot on the TV.

Switching off temporarily

Press \odot on the Remote Commander. The TV enters standby mode and the standby indicator on the front of the TV lights up.

To switch on again

Press \square , PROG +/-, or one of the number buttons on the Remote Commander.

Switching off completely

Depress \odot on the TV.

Selecting TV Programmes

Press PROG +/- or press number buttons.

To select a double-digit number

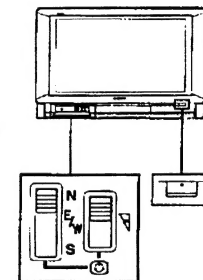
Press +/-, then the number. For example, if you want to choose 23, press +/-, 2 and 3.

Adjusting the Volume

Press \triangle +/-.

If the picture is rotated by the terrestrial magnetism

Set the \odot selectors so that the picture becomes as level as possible.



MANUAL PROGRAMME PRESET

Manual Fine-Tuning

Normally, the AFT (automatic fine-tuning) is already operating. However, if the picture is distorted, you can use the manual fine-tuning function to obtain better picture reception.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Manual Programme Preset with Δ or ∇ and press OK. The MANUAL PROGRAMME PRESET menu appears. (See Fig. 23.)
- 4 Using Δ or ∇ , select the programme position corresponding to the channel which you want to manually fine-tune, and press OK repeatedly until the AFT position changes colour.
- 5 Fine-tune the channel with Δ or ∇ so that you get the best TV reception. As you press the cursor buttons, the frequency changes from -15 to +15. (See Fig. 24.)
- 6 After fine-tuning, press OK. The cursor appears beside the next programme position (at the left margin). (See Fig. 25.) Now the fine-tuned level is stored.
- 7 Repeat steps 4 to 6 to fine-tune other channels.

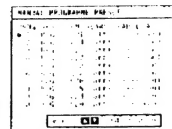


Fig. 23.

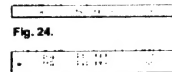


Fig. 24.

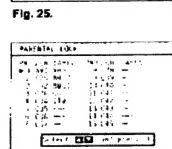


Fig. 25.

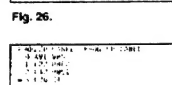


Fig. 26.

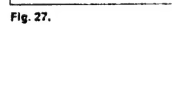


Fig. 27.

PARENTAL LOCK

Parental Lock

You can prevent undesirable broadcasts from appearing on the screen. We suggest you use this function to prevent children from watching programmes which you consider unsuitable.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Parental Lock with Δ or ∇ and press OK. The PARENTAL LOCK menu appears. (See Fig. 26.)
- 4 Using Δ or ∇ , select the programme position you want to block and press OK. The CH and LABEL of the selected programme number, change colour indicating that this programme is now blocked. (See Fig. 27.)
- 5 Repeat step 4 to block other programme positions.

Cancelling blocking

- 1 On the PARENTAL LOCK menu, select the programme position you want to unblock with Δ or ∇ .
- 2 Press OK. The CH and LABEL change to normal colour indicating that the blocking has been cancelled.

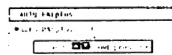


Fig. 28.

AUTO PALplus

Auto PALplus

PALplus is a new broadcasting system with the following features:

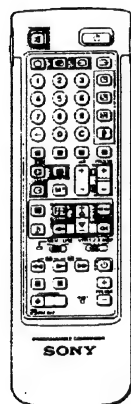
- Backward compatibility to the PAL standard
- Broadcasting in 16:9 format
- Improved video signal quality (The resolution is 576 lines against 432 lines in conventional 16:9 programmes)

If you preset AUTO PALplus to ON and the PALplus signal is being transmitted, the screen mode automatically changes from any mode to the PALplus mode (see page 49). When the PALplus programme is finished, the screen mode automatically returns to the previous mode.

- 1 Press MENU to display the main menu.
- 2 Select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 3 Select Auto PALplus with Δ or ∇ and press OK. The AUTO PALplus menu appears (see Fig. 28).
- 4 Press OK.
- 5 Select ON or OFF with Δ or ∇ and press OK.

For details of the teletext operation, refer to page 51.

For details of the video input picture, refer to page 55.



Watching Teletext or Video Input

Watching teletext

- Press **TEXT** to view the teletext.
- Press three number buttons to select a page.
- Press one of the coloured buttons for fastext operation.
- Press **TEXT** (PAGE +) or **TEXT** (PAGE -) for the next or preceding page.
- To go back to the normal TV picture, press **OK**.

Watching a video input picture

Press **VIDEO** repeatedly until the desired video input appears. To go back to the normal TV picture, press **OK**.

More Convenient Functions

Use the Full-Function side of the Remote Commander.

Displaying the on screen indications

- Press **OSD** once to display all the indications. They will disappear after some seconds.
- Press **OSD** twice to have the programme number and label stay on screen. Press twice again to make indications disappear.

Muting the sound.

Press **MUTE**.
To resume normal sound, press **MUTE** again.

Displaying the time

Press **TIME**. This function is available only when teletext is broadcast.

To make the time display disappear, press **TIME** again.

Displaying the Programme Table

Press **OK**. A Programme Table will be displayed on the right side of the TV screen (See Fig.29.).

Selecting TV programmes

Press **PROG** +/- or select the desired programme position using **Δ** or **∇** and press **OK**.

Freezing the Picture

When watching the TV you have the possibility to "freeze" the picture. Press **FREEZE**. Press the button again to return to the normal TV picture.

Changing the Screen format

Press **ASPECT** repeatedly to change the Screen mode as follows:

- Wide Zoom (imitation of 16:9 for 4:3 broadcast)
- Normal (4:3 picture)
- Zoom (imitation of 16:9 for movies broadcast in cinematic format)
- Full (for 16:9 broadcast).
- PALplus (for PALplus broadcast)

See also page 49 for more information.

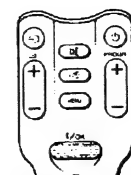
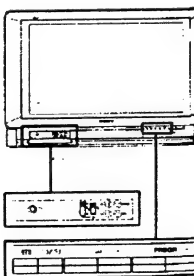
Operating the TV Using the Buttons on the TV

With the buttons on the TV, you can select programmes, adjust the volume, select the video input sources and utilise the menu functions.

- Press **PROG** +/- to switch on the TV from standby mode.
- Press **VOLUME** +/- to adjust the volume.
- Press **VIDEO** to select the video input.
- Press **ASPECT** repeatedly to change the picture aspect.
- Press **MENU** to display the menu screen. Using **Δ** or **∇** select an item you want to change. Then press **OK** to confirm.

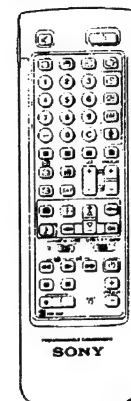


Fig. 29.



PICTURE CONTROL

SOUND CONTROL



If you have made a mistake:
Press **←** to go back to the previous position.
To go back to the main menu:
Keep pressing **←**.
To go back to the normal TV picture:
Press **MENU**.

Note:
• HUE is only available for NTSC colour system and RESOLUTION does not work for SECAM colour system.
• If you have selected PALplus as a screen mode, RESOLUTION is automatically set to HIGH and the cursor skips RESOLUTION.

Note on LINE OUT:
The audio level and the dual sound mode output from the G+ jack on the rear correspond to the HEADPHONES VOLUME and DUAL SOUND settings.

When watching a video input source with stereo sound:
You can select DUAL SOUND to change the sound.

Adjusting and Setting the TV Using the Menu

Adjusting the Picture and Sound

Although the picture and sound are adjusted at the factory, you can adjust them to suit your own taste. In addition, you can reduce the picture noise or set the resolution to obtain a higher quality picture. You can also select dual sound (bilingual) programmes when available or adjust the sound for listening with the headphones (P) or individually adjust and store the volume level of each channel (Volume offset). Also you have the possibility to adjust the sound to your individual taste using the Graphic Equalizer and special Sound effects.

- Press **PICTURE** (for picture) or **SOUND** (for sound) on the Remote Commander.
or
Press **MENU** and select Picture Control or Sound Control, then press **OK**.
The PICTURE CONTROL or SOUND CONTROL menu appears. (See Fig. 30 or Fig. 31)
- Using **Δ** or **∇**, select the item you want to adjust and press **OK**. The selected item changes colour. (See Fig. 32)
- Adjust the setting with **Δ** or **∇** and press **OK**. The cursor appears beside the next item (at the left margin). (See Fig. 33)
For the effect of each control, see the table below.
- Repeat steps 2 and 3 to adjust other items.

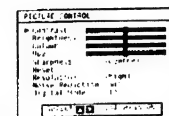


Fig. 30.

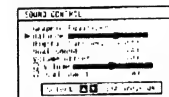


Fig. 31.

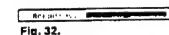


Fig. 32.



Fig. 33.

Effect of each control

PICTURE CONTROL	Effect
Contrast	Less ——— More
Brightness	Darker ——— Brighter
Colour	Less ——— More
Hue	Greenish ——— Reddish
Sharpness	Min. (minimum) — Centre — Max. (maximum)
Reset	Resets picture to the factory preset levels.
Resolution	Normal ——— high : Obtain a higher quality picture
Noise Reduction	ON: Reduction of picture noise in case of weak signals
Digital Mode	Mode I: Normal Mode II: LFR (Line Flicker Reduction) off

SOUND CONTROL	Effect
Graphic Equalizer	(See page 46 for more information)
Balance	More left ——— More right
Digital Surround	OFF: Normal ON: Choice between special sound effects: Dome → Hall → Arena → Simulated (gives width to a monaural source)
Dual Sound	A : left channel B : right channel stereo mono The selected mode of the A-D-B indicator on the TV lights up. (for NICAM broadcasts see next page)
Volume offset	-7 Less 0 More +7
Headphones: P Volume	Less ——— More
P Dual Sound	A : left channel B : right channel PIP (if PIP is switched on you can select the PIP sound for the headphones) STEREO MONO

Note: The modifications made in "USER" mode will be stored. All other settings are reset to factory-set level when you change to another mode.

Graphic Equalizer

Using this function you can individually adjust the sound by cutting and boosting selected frequencies. You can also select between the following modes:

Flat → POP → Rock → Jazz → Vocal → User

- 1 Select Sound Control in the main menu, then select Graphic Equalizer using Δ or ∇ and press OK. The GRAPHIC EQUALIZER menu appears (see Fig. 34).
- 2 Press OK. The colour of "Mode" changes. Select the desired mode with Δ or ∇ and press OK.
- 3 If you want to modify a mode, select the desired bar of a frequency band using Δ or ∇ and press OK. The selected bar changes colour. Using Δ or ∇ adjust the level of frequency and press OK. In this way you can adjust all 5 graphic bars.
- 4 Press MENU to return to the normal TV mode.

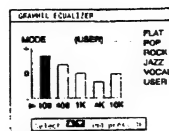


Fig. 34.

Selecting Nicam Broadcasts*

This Sony TV has been designed to select Nicam broadcasts when available. Whenever a Nicam broadcast is received, "NICAM" appears briefly on the screen. When the Nicam programme ends, or you switch channels to one without Nicam, the A-CD-B indicators, on the TV will switch off.

Nicam programmes can be broadcast in two ways. You may select the sound you want to hear in either of these by first following the instructions explained on page 45.

Service Being Broadcast	Action	Effect	Indication on the TV A-CD-B
Stereo	Press Δ or ∇	Stereo Nicam (stereo 2 channel mono)	STEREO
Press Δ or ∇ again to return to stereo Nicam (mono 2-channel)			
Bilingual	press Δ or ∇	Channel A Nicam Channel B Nicam mono	CH A CH B
Press Δ or ∇ again to return to channel A Nicam			

* Depending on availability of service.

PROGRAMME CATCHING

Using Programme Catching

Using Δ or ∇ select "Programme Catching" from the Main menu and press OK. Now a scan of 12 successive programmes (11 still pictures, 1 live picture where the cursor is positioned) is displayed on the TV screen starting from the programme tuned in. Using Δ or ∇ you can move the cursor and in this way update the still pictures. The programme scanning starts again when you select a programme position lower or higher than the 12 displayed ones (See Fig. 35).

To select a Programme using Programme Catching
Using Δ or ∇ select the desired programme position and press OK. Now the selected programme is displayed and you are back in the normal TV mode.



Fig. 35.

TIMER

To switch off the timer:
Select "OFF" in step 4.

To check the remaining time:
Press CB.

Using the Sleep Timer

You can select a time period after which the TV automatically switches into standby mode.

- 1 From the main menu, select Preset/Timer with Δ or ∇ and press OK. The PRESET/TIMER menu appears.
- 2 Using Δ or ∇ select "Timer" and press OK. The TIMER menu appears (see Fig. 36).
- 3 Press OK. The time period option changes colour.
- 4 Select the time period with Δ or ∇ . The time period (in minutes) changes as follows:
10 → 20 → 30 → 40 → 50 → 60 → 70 → 80 → 90
↑ OFF
- 5 After selecting the time period, press OK. The cursor moves back to the left margin and the timer starts counting. One minute before the TV switches into standby mode, a message is displayed on the screen.

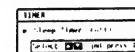
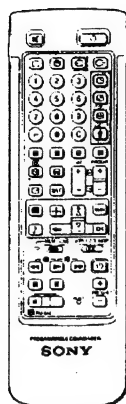


Fig. 36.

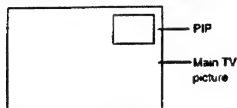
PIP (Picture In Picture)



Note:
• RGB input source cannot be displayed in PIP.

• PIP is not available in the Zoom mode or the PALplus mode.

With this function you can display a "PIP screen" (small picture) within the main TV picture. In this way you can watch or monitor the video output from any connected equipment (for example from a VCR) while watching TV or vice versa. For information about connection of other equipment, refer to page 54.



Switching PIP on and off

Press .
The PIP screen will be displayed. The PIP picture will come from the source chosen when the TV was last used.

To switch PIP off
Press again.

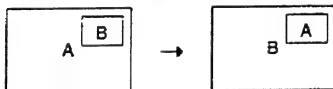
Selecting a PIP source

Press .
The symbol will be displayed at the bottom, left-hand corner of the screen.
Press repeatedly until the desired PIP source is indicated (e.g. TV, AV1, AV2, YC2, AV3, YC3, AV4, YC4).

Note:
If no video source has been connected, the PIP picture will be noisy or dark.

Swapping screens

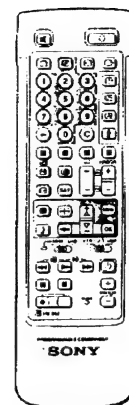
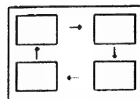
Press .
The main screen will switch the picture with the PIP screen.



Note:
If a TV programme is on the PIP screen and a video source on the main picture, and you want to change channels, first press and then the programme buttons or PROG .

Changing the position of the PIP

Press repeatedly to change the position of the PIP screen within the main screen. There are four different positions available.



Note:
• PALplus is not available in the signal via AV2 or YC2 terminal.
• PALplus mode is manually selectable only when the AUTO PALplus is set to "OFF" (see page 42) and the PALplus signal is being transmitted.

Note:
To set Digital Zoom to on or off, make sure of the following:
1) the screen mode is set to Zoom; 2) the input source is not from AV2 or YC2 terminal. In other cases, the cursor skips Digital Zoom and the Digital Zoom doesn't work regardless of whether the display is on or off. (If the input source is a signal of NTSC colour system or video games, the cursor skips as well.)

Operating Screen Mode/PIP using the Menu

Using the Screen Mode/PIP menu you have the possibility to change the aspect ratio for the TV display for wide screen effects, operate the PIP mode, scan 12 successive TV pictures on the screen (Programme Catching), display 11 successive freeze pictures (Photo Mode) or reproduce the main picture image by image (Strobe function).

- 1 Press MENU to display the main menu.
- 2 Select "Screen Mode/PIP" with or and press OK. The SCREEN MODE/PIP menu appears (see Fig. 37).

You have the choice among the following modes:

- Wide Zoom: Imitation of wide screen effect (16:9) for 4:3 broadcasts (see Fig. 36).
- Normal: for normal ratio 4:3 (see Fig. 39).
- Zoom: Imitation of wide screen effect (16:9) for movies broadcast in cinematographic format (see Fig. 40).
- Full: for 16:9 broadcasts (see Fig. 41).
- PALplus: for PALplus broadcasts (see Fig. 40). Compared with the Zoom mode above, you can enjoy the pictures with higher resolution.

- a) Switching Digital Zoom on and off (only for Zoom mode)
Using or select Digital Zoom and press OK. Using or select ON for a sharp and precise picture or OFF for a softer picture and press OK.
- b) Changing the Screen position (only for Zoom mode)
When using the Zoom mode part of the picture at the top and bottom will be cut off. With the help of the function "Screen position" you can move the screen up- or downwards in order to see the cut-off part of the screen (e.g. to read the subtitles).
Using or select "Screen position" and press OK. The selected item changes colour. Using or adjust the screen position and press OK.
- c) Switching PIP on and off
Using or select "PIP" and press OK. Using or select "ON" to display the PIP screen and "OFF" to switch it off and press OK.
- d) Changing the PIP position
Using or select "PIP position" and press OK. Using or repeatedly to change the position of the PIP screen and press OK.

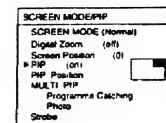


Fig. 37.

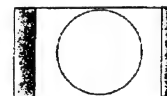


Fig. 36.



Fig. 39.

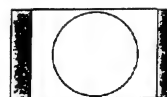


Fig. 38.



Fig. 40.

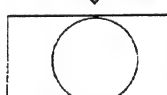


Fig. 41.

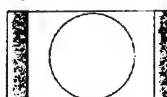


Fig. 41.

MULTI PIP Functions

- a) **Programme Catching**
Using Δ or ∇ select "Programme Catching" and press OK. Now a scan of 12 successive programmes (11 still pictures, 1 live picture where the cursor is positioned) is displayed on the TV screen starting from the programme tuned in. Using Δ or ∇ you can move the cursor and in this way update the still pictures. The programme scanning starts again when you select a programme position lower or higher than the 12 displayed ones (See Fig. 42).

To select a Programme using Programme Catching
Using Δ or ∇ select the desired programme position and press OK. Now the selected programme is displayed and you are back in the normal TV mode.

- b) **Photo Mode**
Using Δ or ∇ select "Photo" and press OK. Now the main picture is displayed as a succession of 11 still pictures and a 12th picture which is live (see Fig. 43). Using Δ or ∇ the Photo mode starts again. Press OK to return to the normal TV mode.

Strobe Mode

Using Δ or ∇ select "Strobe" and press OK. Now the TV picture is displayed image by image, creating a slow motion effect (see Fig. 44). Using Δ or ∇ select the speed of the motion (3 different speeds are available). Press OK to return to the normal TV mode.



Fig. 42.

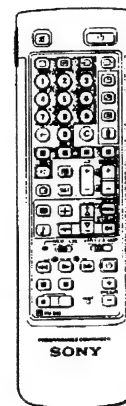


Fig. 43.



Fig. 44.

Teletext



Note:
Teletext errors may occur if the broadcasting signals are weak.

Note:
When you superimpose the teletext in the WIDE ZOOM mode, the screen mode automatically changes to the NORMAL mode.

Note:
Fasttext operation is only possible, if the TV station broadcasts Fasttext signals.

TV stations broadcast an information service called Teletext via the TV channels. Teletext service allows you to receive various information pages such as weather reports or news at any time you want. For advanced teletext operation, use the buttons on the Full-Function side of the Remote Commander.

Direct Access Functions

Switching Teletext on and off

- 1 Select the TV channel which carries the teletext broadcast you want to watch.
 - 2 Press [Teletext] to switch on teletext.
A teletext page will be displayed (usually the index page). If there is no teletext broadcast, "No text available" is displayed on the information line at the top of the screen.
- To switch teletext off
Press [Off] or [Teletext] .

Selecting a teletext page

With direct page selection

Use the number buttons to input the three digits of the chosen page number.
If you have made a mistake, type in any three digits. Then re-enter the correct page number.

With page-catching

- 1 Select a teletext page with a page overview (e.g. index page).
- 2 Press OK. Using Δ or ∇ , select the desired page. "Page Catching" will be displayed on the information line. Press OK. The requested page will appear in a few seconds.

Press [Teletext] to resume normal teletext reception.

Accessing next or preceding page

Press [PAGE +] or [PAGE -] .

The next or preceding page appears.

Superimposing the teletext display on the TV programme

- Press [Teletext] once in teletext mode or twice in TV mode.
- Press [Teletext] again to resume normal teletext reception.

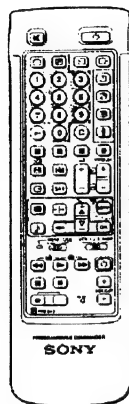
Preventing a teletext page from being updated

- Press [HOLD] . The HOLD symbol "H" is displayed on the information line.
- Press [Teletext] to resume normal teletext reception.

Using Fasttext

With Fasttext you can access pages with one key stroke. When a Fasttext page is broadcast, a colour-coded menu will appear at the bottom of the screen. The colours of this menu correspond to the red, green, yellow and blue buttons on the Remote Commander.

Press the corresponding coloured button on the Remote Commander which corresponds to the colour-coded menu. The page will be displayed after some seconds.



Note:
Some of the features may not be available depending on the Teletext service.

Note on Subtitles:
If the subtitles are not broadcast on page 888, please select the subtitle page using the number buttons.

To cancel the request:
Select "OFF" for the TIME PAGE setting.

Using the Teletext Menu

This TV is provided with a menu-guided teletext system. When teletext is switched on, you can use the menu buttons to operate the teletext menu. Select the teletext menu functions in the following way:

- 1 Press MENU. The menu will be superimposed on the teletext display. (See Fig. 45)
- 2 Using Δ or ∇ -, select the teletext function you want and press OK. (See Fig. 46)

USER PAGES/PRESET USER PAGES

See page 53 for information about presetting and operating the user pages.

INDEX

The index will give you an overview of the contents of the teletext and the page numbers.

TOP/BOTTOM/FULL

For convenient reading of a teletext page, you can enlarge the teletext display with the ability to scroll up and down the screen. After having selected the function, an information line Top/Bottom/Full will be displayed. (See Fig. 47)

Press Δ for top to enlarge the upper half. For Bottom keep pressing ∇ -, to enlarge the lower half. Press OK for Full to resume the normal size.

Press \square to resume normal teletext reception.

TEXT CLEAR

After having selected the function, you can watch a TV programme while waiting for a requested teletext page to be captured (The symbol changes colour) (see Fig. 48).

Press \square to view the requested page.

SUBTITLES

Your teletext service will inform you if a TV programme is subtitled. After having selected the function the subtitles will be displayed.

REVEAL

Sometimes pages contain concealed information, such as answers to a quiz. The reveal option lets you disclose the information. After having selected the function, an information line "REVEAL ON/OFF" will be displayed. (See Fig. 49)

Using Δ or ∇ -, select ON to reveal the information or OFF to conceal it again.

Press \square to resume normal teletext reception.

TIME PAGE

Your teletext service will inform you, if a time coded page is available. You may have a page (e.g. an alarm page) displayed at a certain time.

- 1 Press OK, using Δ or ∇ -, select on and press OK.
- 2 To select the desired page, enter the three digits of the page number using the number buttons.
- 3 To select the desired time, enter four digits for the desired time (e.g. 1800) using the number buttons. Press MENU, the selected time is displayed at the top in the left-hand corner. At the requested time, the page will be displayed.

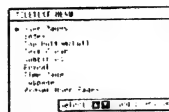


Fig. 45.

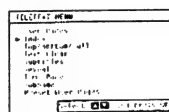


Fig. 46.

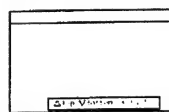


Fig. 47.

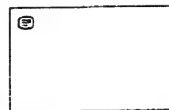


Fig. 48.

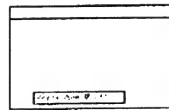


Fig. 49.

To cancel the request:
Select "Subpage" and press OK.

If two broadcasting stations use the same Teletext:
You can preset one bank to 2 different programme positions.

SUBPAGE

You may want to select a particular teletext page from several subpages which are rotated automatically. After having selected the function, an information line will be displayed.

To select the desired subpage, enter four digits using PROG+/- or the number buttons. (e.g. enter 0002 for the second page of a sequence).

User Page Bank System

You can store up to 30 pages in the "Teletext page bank system". In this way you have quick access to the pages you watch frequently.

Storing pages

There are 5 "banks" (A to E) for 5 teletext stations. In each bank you can store 6 preferred pages (P1 to P6).

- 1 Press \square (if Teletext is not on already) and MENU to show the TELETEXT MENU display.
- 2 Select PRESET USER PAGES with Δ or ∇ - and press OK.
- 3 Select the desired bank with Δ or ∇ - and press OK. The cursor will go to the first position (P1) of the preferred pages.
- 4 Input the three digits of your first preferred page with the number buttons and press OK. The cursor will go to the second position.
- 5 Repeat step 4 for the other 5 page numbers you want to preset. If you do not want to preset all 6 page numbers available, press OK without inserting any number. After having finished the presetting press OK repeatedly until the cursor appears besides the next bank at the left margin.
- 6 Select Allocate Bank with Δ or ∇ - and press OK.
- 7 Select the programme position for which you have preset pages with Δ or ∇ - and press OK. (See Fig. 50)
- 8 Select the desired bank with Δ or ∇ - (Banks A to E are available) and press OK.
- 9 Repeat steps 3 to 8 for the other 4 banks available.

Displaying User Pages

- 1 Select MENU.
- 2 Select User Pages with Δ or ∇ - and press OK. A table of the stored preferred pages will be displayed. (See Fig. 51)
- 3 Select the desired page with Δ or ∇ - and press OK. The page will be displayed after some seconds.

OR

You can use the coloured buttons on the Remote Commander to have quick access to the first four User pages. Page 1 corresponds to the red button, P 2 to the green one, P 3 to the yellow one and P 4 to the blue button.

To select the desired page press the respective coloured button while you are in TV mode. Now the Page number of this teletext page will appear in white at the top in the left-hand corner of the TV screen. When the page number changes colour the page is available. Press the coloured button again to display the page.

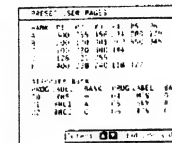


Fig. 50.

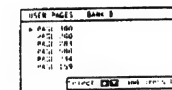


Fig. 51.

Connecting and Operating Optional Equipment

Connecting Optional Equipment

You can connect optional audio-video equipment to this TV such as VCRs, video disc players, and stereo systems.

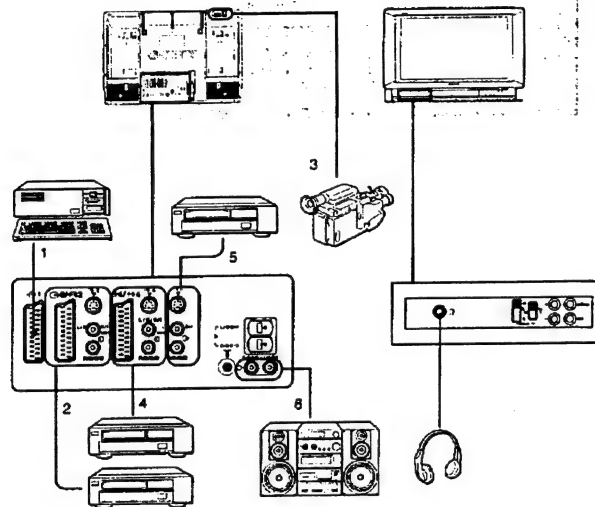
To connect a VCR using the 1 terminal: Connect the aerial output of the VCR to the aerial terminal 1 of the TV.

We recommend that you tune in the signal to programme number "0". For details see "Preset Channels Manually" on page 38.

If the picture or the sound is distorted: Move the VCR away from the TV.

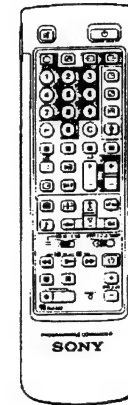
S video input (Y/C input): Video signals may be separated into Y (luminance or brightness) and C (chrominance) signals. Separating the Y and C signals prevents them from interfering with one another, and therefore improves picture quality (especially luminance). This TV is equipped with 3 S Video input jacks through which these separated signals can be input directly.

When connecting a monaural VCR: Connect only the white C jack to both the TV and VCR.



Acceptable input signal	Available output signal
1 Normal audio/video and RGB signal	Video/audio from TV tuner
2 Normal audio/video and S video signal	Video/audio from selected source
3 Normal audio/video and S video signal	No outputs
4 Normal audio/video and S video signal	Video/audio displayed on TV screen (monitor out)
5 No inputs	S video/audio signal displayed on TV screen (monitor out)
6 No inputs	Audio signal (variable)

Selecting input with PROG +/- or number buttons: You can preset video input sources to the programme positions so that you can select them with PROG +/- or number buttons. For details, see "Preset channels manually" on page 38.



Selecting input and output

This section explains how to view the video input picture (of the video source connected to your TV), and how to select the output signal using direct access buttons or the menu system.

Selecting input

Press 1 repeatedly to select the input source.

The symbol of the selected input source will appear.

To go back to the normal TV picture

Press 0.

Input modes

Symbol	Input signal
1	Audio/video input through the 1 connector
2	RGB input through the 21 connector
2	Audio/video input through the 2/2-32 connector
2	S video input through the 2/2-32 or -32 connector
3	Audio/video input through 3 and -33 connectors
3	S video input through the -33 connectors (4-pin connector)
4	Audio/video input through the 4/-34 connector
4	S video input through the 4/-34 or -34 connector (4-pin connector)

Selecting the output

The 2/2-32 connector outputs the source input from the other connectors.

Press 0 repeatedly to select the output.

The symbol of the selected output source appears.

Output modes

Symbol	2/2-32 connector outputs
1	The audio/video signal from the 1 connector
2	The audio/video signal from the 2/2-32 connector
2	The audio/S video signal from the 2/2-32 connector
3	The audio/video signal from the 3, -33 connectors
3	The audio/S video signal from the -33, -33 connectors
4	The audio/video signal from the 4/-34 connector
4	The audio/S video signal from the 4/-34 connector
TV	The audio/video signal from the 1 aerial terminal

Checking and selecting the input and output sources using the menu

You can display the menu to see which input sources are selected for the TV screen and PIP screen, and which output source is selected. You can also select them on the menu display.

- 1 Select Video Connection with Δ or ∇ and press OK. The VIDEO CONNECTION menu appears. (See Fig. 52)
- 2 Select TV Screen (input source for the TV screen), PIP (input source for the PIP screen), or output (output source) with Δ or ∇ and press OK. One of the source items changes colour. (See Fig. 53)
- 3 Select the desired source with Δ or ∇ . (See Fig. 54)
- 4 Press OK. The selected source is confirmed, and the cursor appears. (See Fig. 55)
- 5 Repeat steps 2 to 4 to select the source for other inputs or outputs.

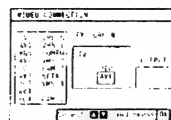


Fig. 52.



Fig. 53.

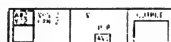


Fig. 54.

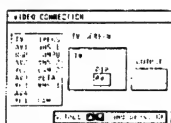
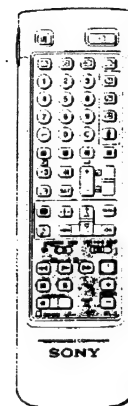


Fig. 55.



When recording
When you use the RECORD button, make sure to press this button and the one to the right of it simultaneously.

- Do not move the Remote Commanders during programming.
- After programming, check to see if all the programmed functions work. It may be the case that a function cannot be programmed.
- When you want to operate the audio or video equipment: Make sure that the VTR 1/2/3 MDP selector is set to the position you used during programming.
- When you replace the Remote Commander batteries, the programmed functions remain stored for 30 minutes without a battery.
- When the memory of the programmable Remote Commander is full, the MEM indicator lights up.

Remote Control of Other Equipment

You can use the TV Remote Commander to control most Sony remote-controlled video equipment such as: Beta, 8mm or VHS VCRs or video disc players. Additionally you can programme these buttons to control also audio and video equipment of other manufacturers.

Tuning the Remote Commander to the equipment

- 1 Set the VTR 1/2/3 MDP selector according to the equipment you want to control:
VTR 1: Beta VCR
VTR 2: 8mm VCR
VTR 3: VHS VCR
MDP: Video disc player
- 2 Use the buttons indicated in the illustration to operate the additional equipment.

If your video equipment is furnished with a COMMAND MODE selector, set this selector to the same position as the VTR 1/2/3 MDP selector on the TV Remote Commander.

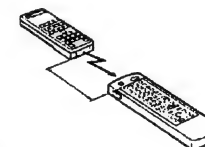
If the equipment does not have a certain function, the corresponding button on the Remote Commander will not operate.

Tuning the Remote Commander to audio or Video equipment of other manufacturers

Your TV Remote Commander is a programmable Remote Commander. This means that you can programme the buttons indicated in the illustration with functions of other Remote Commanders. A function can be stored on any of the buttons and on all four levels of the VTR 1/2/3 MDP selector.

Programming a function

- 1 Set the MEM/USE switch to MEM (Memorize).
- 2 Set the VTR 1/2/3 MDP selector to the desired position.
- 3 Position the two Commanders head to head (see illustration).
- 4 First press the button on the TV Remote Commander onto which you want to programme a function. Now the MEM indicator of the Remote Commander lights up.
- 5 Then press the button on the other Remote Commander, the function of which you want to programme. As soon as the MEM indicator goes out, the function is stored.
- 6 Repeat steps 4 and 5 for all other functions you want to programme. When you have programmed all buttons on one level of the VTR 1/2/3 MDP selector, select another level.
- 7 When you have finished programming, set the MEM/USE switch to USE.














Clearing programmed functions

- 1 Set the MEM/USE switch to MEM.
- 2 Set the VTR 1/2/3 selector to the level of functions you want to clear.
- 3 Press any of the programmable buttons. Now the MEM indicator lights up.
- 4 Keep the RESET button pressed, using the tip of a pen, until the MEM indicator has flashed four times. Now all programmed functions on this level are cleared.
- 5 Reset the MEM/USE switch to USE.

For Your Information

Troubleshooting

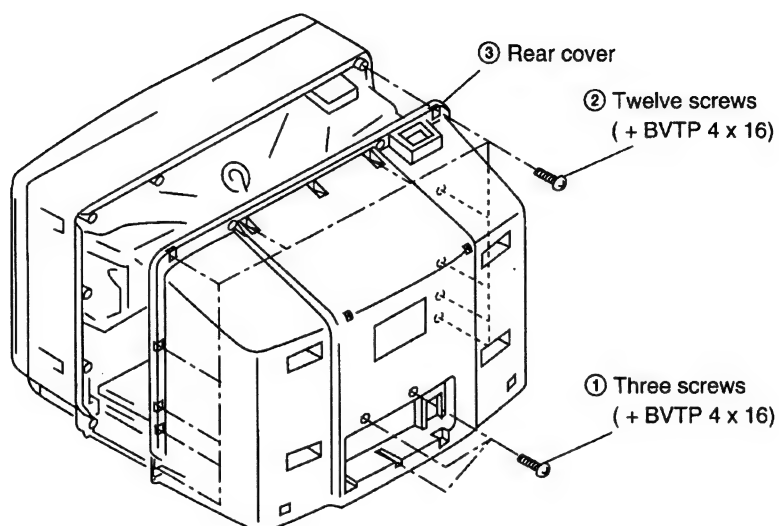
Here are some simple solutions to problems which may affect the picture and sound.

Problem	Solution
No picture (screen is dark), no sound	<ul style="list-style-type: none">• Plug the TV in.• Press  on the TV. (If  indicator is on, press  or a programme number on the Remote Commander.)• Check the aerial connection.• Check if the selected video source is on.• Turn the TV off for 3 or 4 seconds and then turn it on again using .
Poor or no picture (screen is dark), but good sound	<ul style="list-style-type: none">• Press  to enter the PICTURE CONTROL menu and adjust BRIGHTNESS, CONTRAST and COLOUR.
Poor picture quality when watching an RGB video source	<ul style="list-style-type: none">• Press  repeatedly to select .
Good picture but no sound	<ul style="list-style-type: none">• Press .• If  is displayed on the screen, press .
No colour for colour programmes	<ul style="list-style-type: none">• Press  to enter the PICTURE CONTROL menu, select RESET, then press OK.
Remote Commander does not function.	<ul style="list-style-type: none">• Replace batteries.

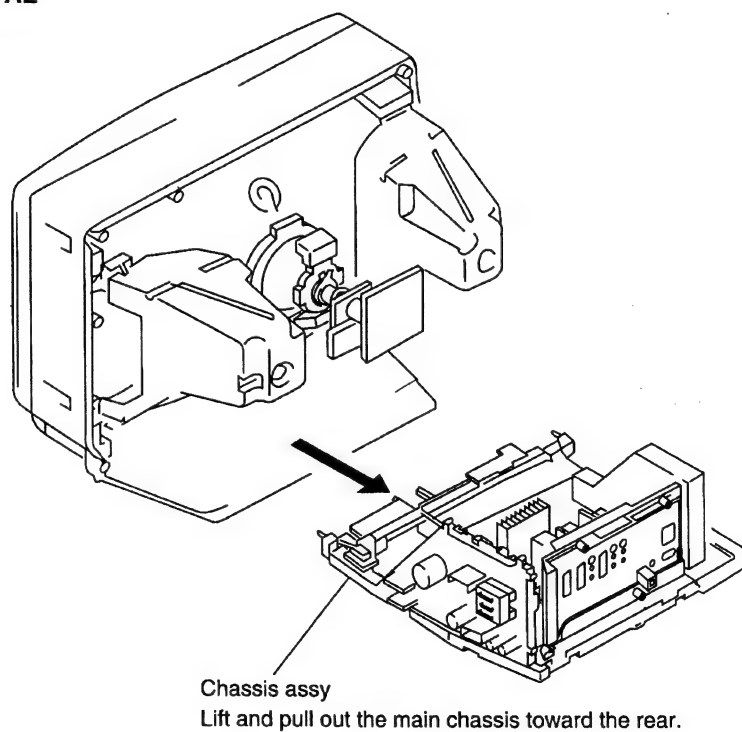
If you continue to have problems, have your TV serviced by qualified personnel. Never open the casing yourself.

SECTION 2 DISASSEMBLY

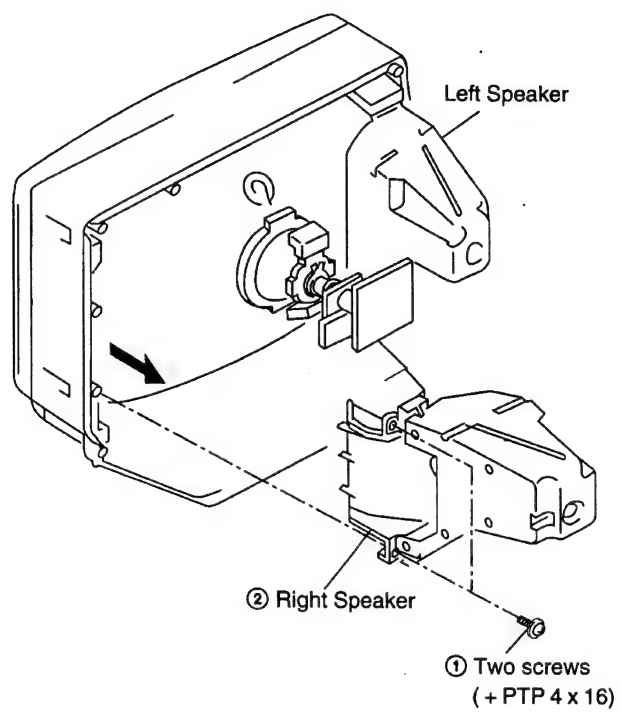
2-1. REAR COVER REMOVAL



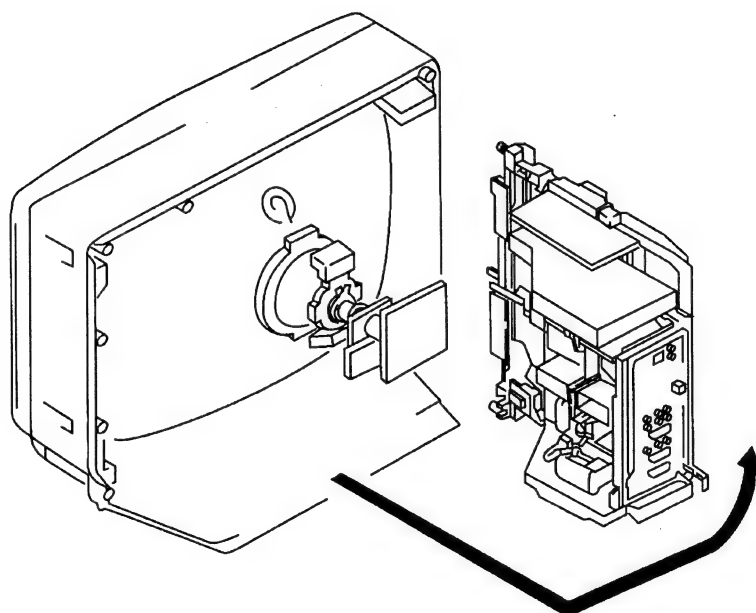
2-2. CHASSIS ASSY REMOVAL



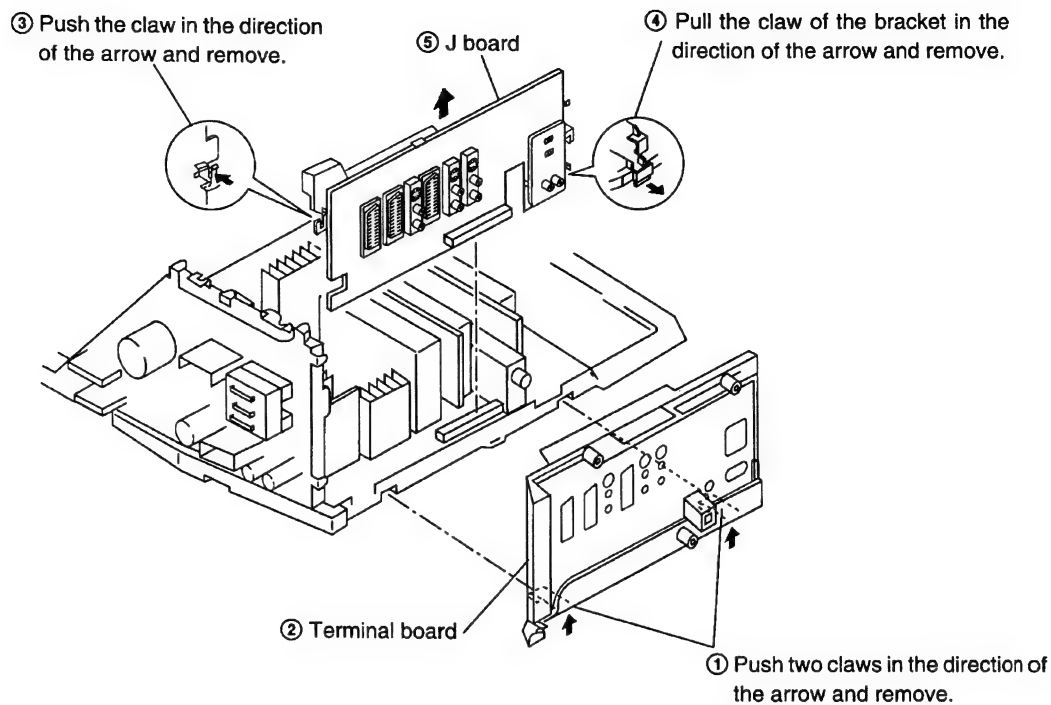
2-3. SPEAKER REMOVAL



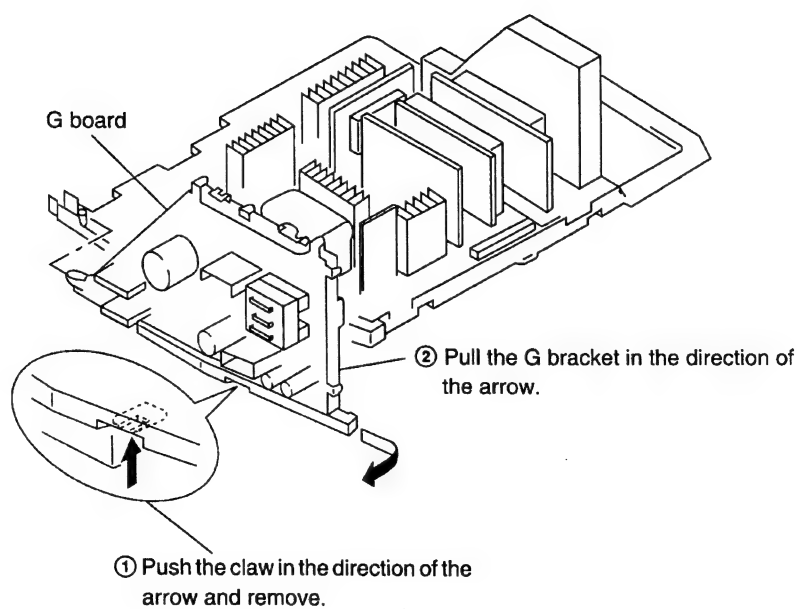
2-4. SERVICE POSITION



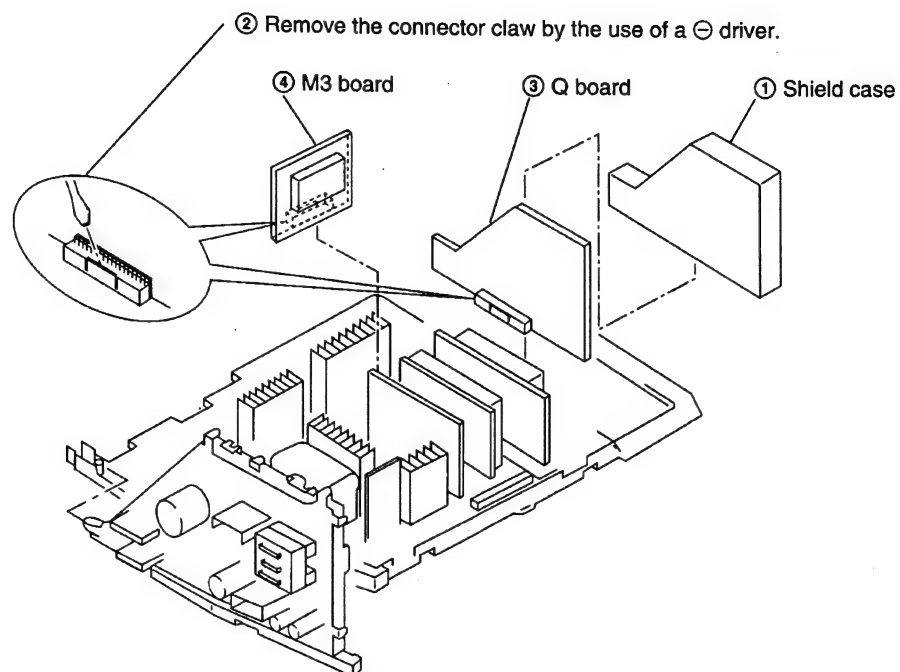
2-5. J BOARD REMOVAL



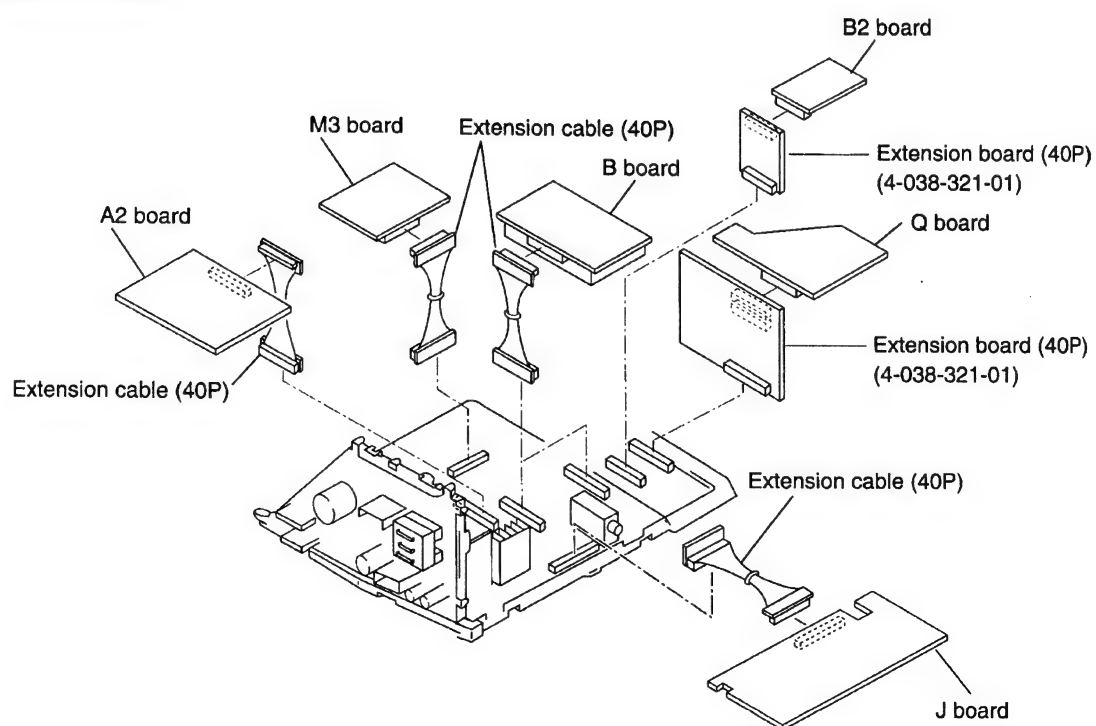
2-6. G BOARDS REMOVAL



2-7. Q AND M3 BOARDS REMOVAL

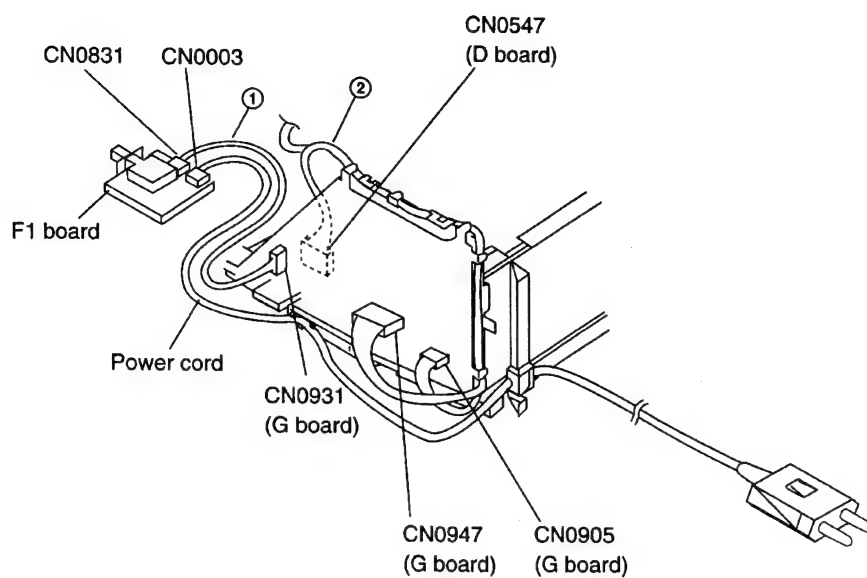


2-8. EXTENSION BOARD

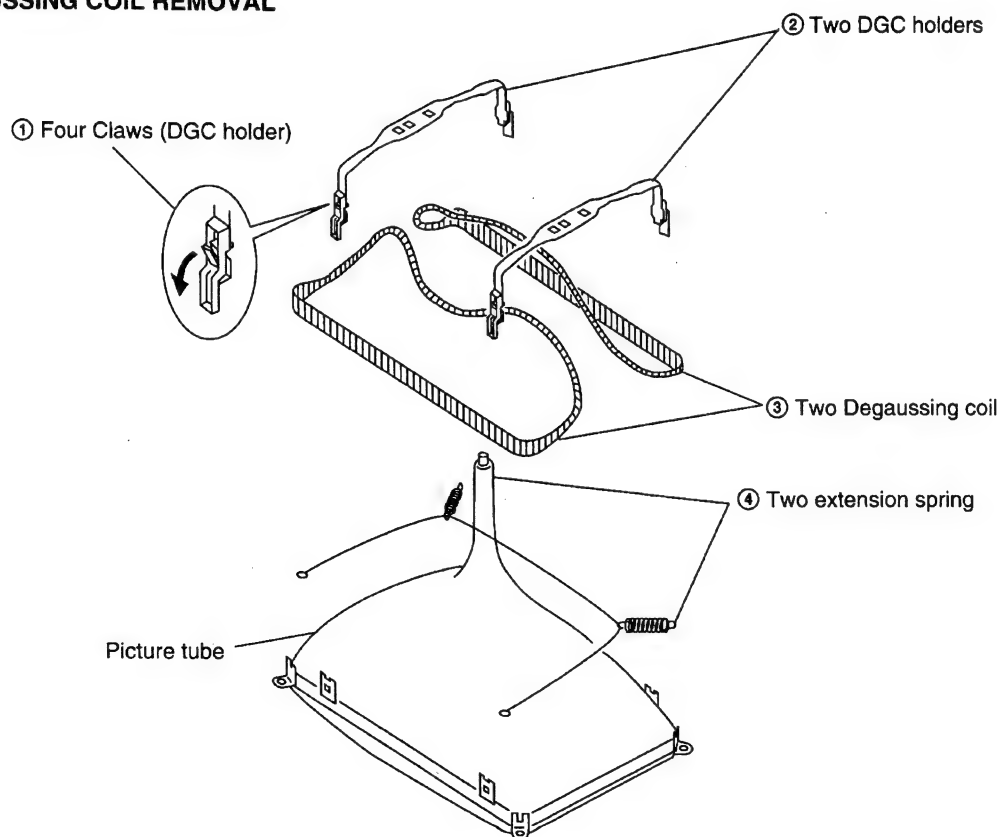


2-9. WIRE DRESSING

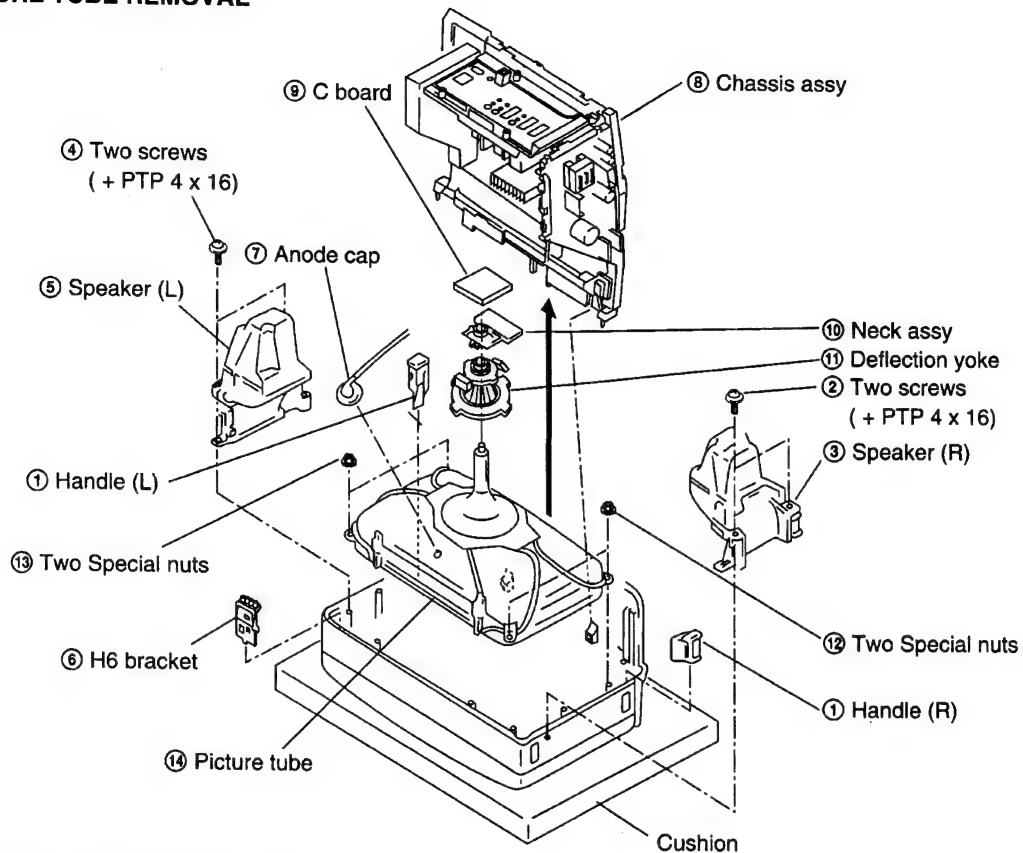
- Keep distance between ① and ②



2-10. DEGAUSSING COIL REMOVAL



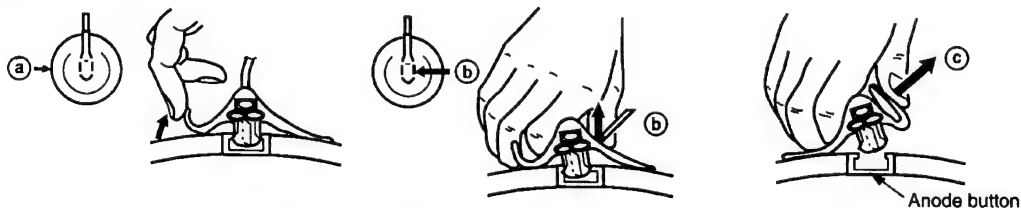
2-11. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

NOTE: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

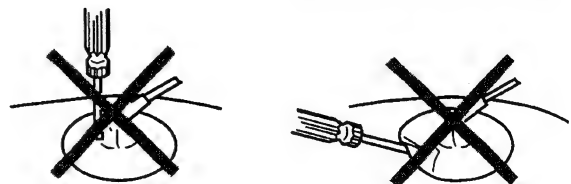
• REMOVING PROCEDURES



- ① Turn up one side of the rubber cap in the direction indicated by the arrow **(a)**.
- ② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow **(b)**.
- ③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow **(c)**.

• HOW TO HANDLE AN ANODE-CAP

- ① Don't hurt the surface of the anode-cap with sharp shaped material!
- ② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.
- ③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.



SECTION 3

SET-UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there is specific instruction to the contrary, carry out these adjustment with the rated power supply.
- Unless there is specific instruction to the contrary, set the controls and switches as this way.

Contrast normal

Brightness normal

- Carry out the following adjustments in this order:

3-1. Beam landing

3-2. Convergence

3-3. Focus

3-4. White balance

Note: Testing equipment required.

1. Colour bar/pattern generator

2. Degausser

3. Vector scope

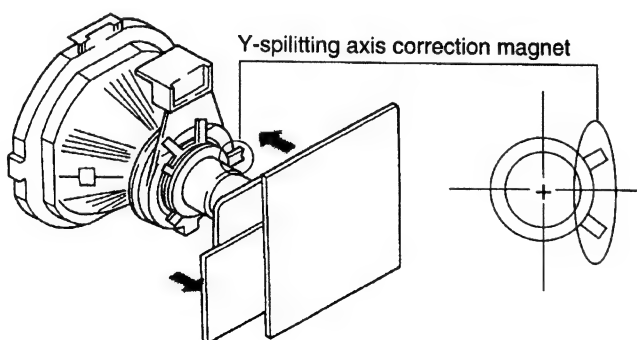
3-1. BEAM LANDING

Preparation:

1. In order to reduce the influence of geomagnetism on the set's picture tube face it east or west.
2. Switch on the set's power and degauss with the degausser.

(1) Adjustment of Correction Magnet for Y-Splitting Axis

1. Input a crosshatch signal with the pattern generator.
2. Picture control is minimum and brightness control is still normal.
3. Position neck assy as shown in Fig. 3-2.
4. Move the deflection yoke forward to touch the CRT and it stands up rightly.
5. Adjust the upper pin and the lower pin symmetrically by opening or closing the Y-splitting axis correction magnet on the neck assy.
6. Return the deflection yoke to original position.



(2) Landing

1. Input a full-white signal with the pattern generator. Maximize the picture setting and adjust the brightness setting.
2. Rough-adjust the focus, horizontal convergence.
3. Loosen the deflection yoke screws, align the purity adjustment knob to the central position. (See Fig. 3-1)
4. Switch the full-white signal to a mono-green signal.
5. Move the deflection yoke backward and adjust with the purity magnet so that the green is at the center and it aligns symmetrically. (See Fig. 3-3)
6. Move the deflection yoke forward and adjust so that entire screen is green.
7. Switch the raster signal to red, then to blue and verify the landing condition.
8. When the position of the deflection yoke has been decided, fasten the deflection yoke with the screws.
9. If the beam does not land correctly in all the corners, use a magnet to adjust it. (See Fig. 3-4)

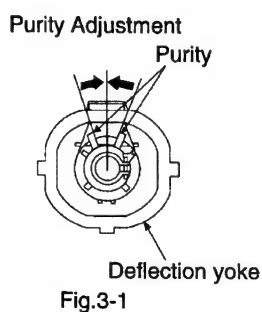
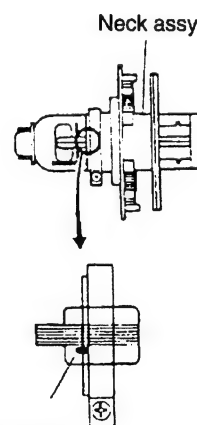


Fig.3-1



Fit the bottom edge of the neck assy with the G3 hole center.

Fig.3-2

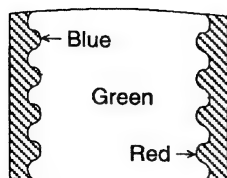


Fig.3-3

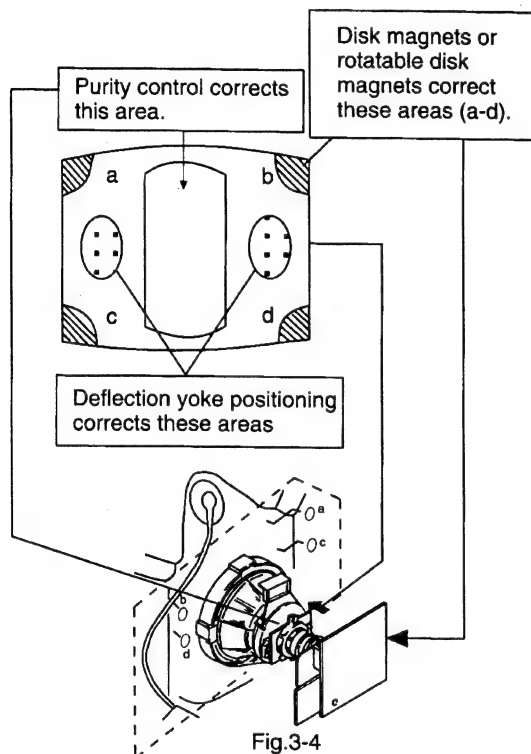
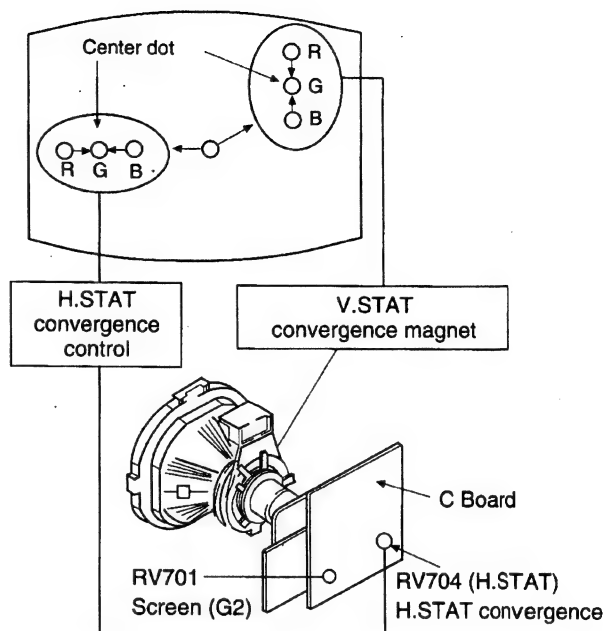


Fig.3-4

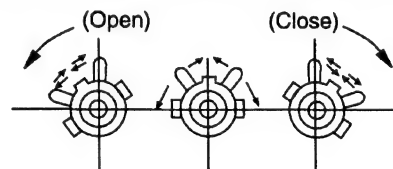
3-2. CONVERGENCE

(1) Screen center convergence (Static convergence)

1. Input a dot signal with the pattern generator. Normalize the picture setting.
2. (Moving horizontally), adjust the H.STAT control so that the horizontal red, green and blue dots coincide at the center of screen.
3. (Moving vertically), adjust the V.STAT magnet so that the vertical red, green and blue points coincide at the center of screen.

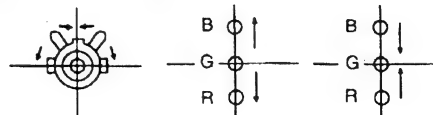


- If the horizontal dots cannot coincide with variable range of the H.STAT convergence, adjust together with the V.STAT convergence while tracking.
(Adjust the convergence by tilting the V.STAT convergence or by opening or closing the V.STAT convergence.)

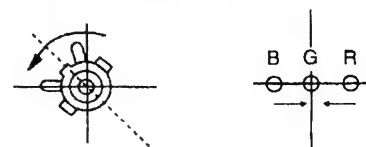


4. Movement of the red, green and blue dots by tilting the V.STAT magnet and by opening or closing the V.STAT magnet.

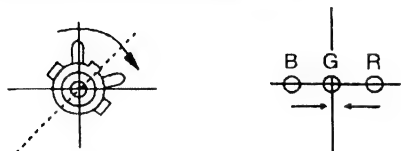
- ① By opening or closing the V.STAT magnet, the red, green and blue points move as shown below



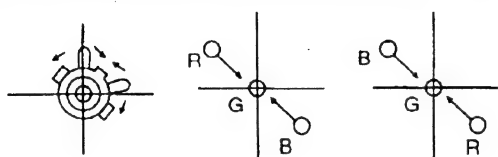
- ② By leaning to counterclockwise the V. STAT magnet, the red, green and blue dots move as shown below.



- ③ By leaning to clockwise the V.STAT magnet, the red, green and blue dots move as shown below.



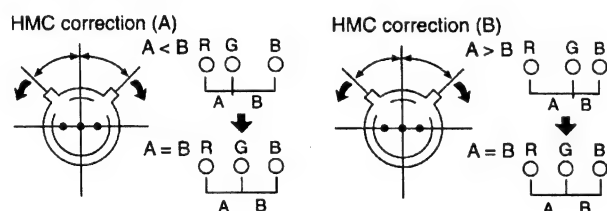
- ④ By leaning and opening or closing the V.STAT magnet, the red, green and blue dots move as shown below.



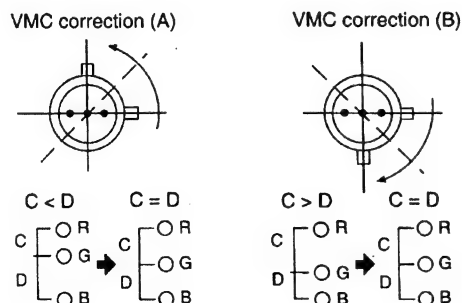
- If the blue dot does not coincide with the red and green points, correct the points by using the BMC (Hexapole) magnet.

- ⑤ Correction for HMC (horizontal mis-convergence) and VMC (vertical mis-convergence) by using the BMC (Hexapole) magnet.

- ① HMC correction by BMC (Hexapole) magnet and movement of an electronic beam.



- ② VMC correction by BMC (Hexapole) magnet and movement of an electronic beam.



Layouts of each knobs

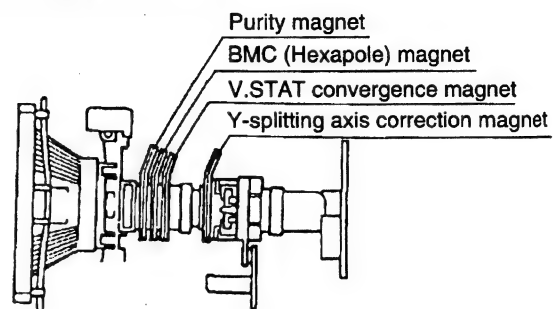


Fig.3-5

(2) Convergence alignment in all the corners of the screen (Dynamic convergence alignment)

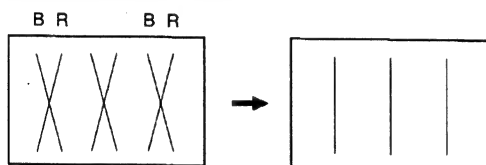
1. Adjust the horizontal convergence at the center of the screen with the horizontal static convergence knob RV702 (H.STAT).
2. After setting the service mode, adjust the dynamic convergence alignment.

(The service mode: Press the remote control push buttons

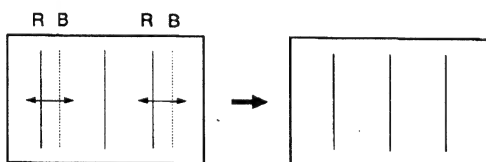
Picture indication → CH5 → Volume +
→ Power continuously.)

3. Pressing the remote control push buttons **1** and **4**, choose the item. Adjust with the push buttons **3** and **6**.

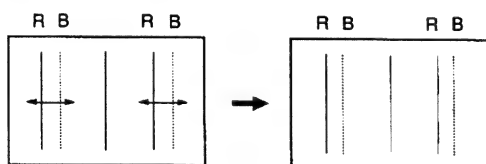
1) Y. CROSS adjustment (DC 1)



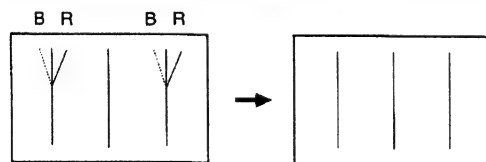
2) H. AMP adjustment (DC 3)



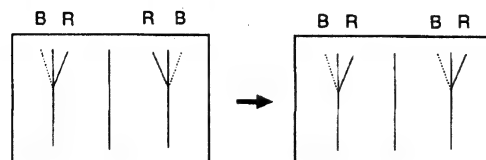
3) TILT adjustment (DC 4)



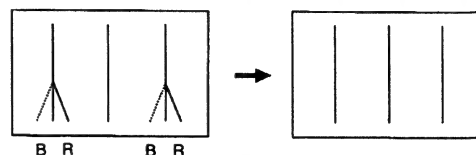
4) C. BOW adjustment at the upper side of the screen (DC 5)



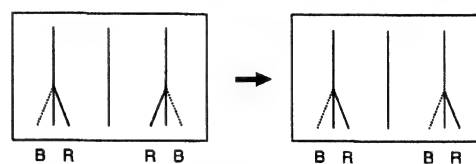
5) TILT adjustment at the upper side of the screen (DC6)



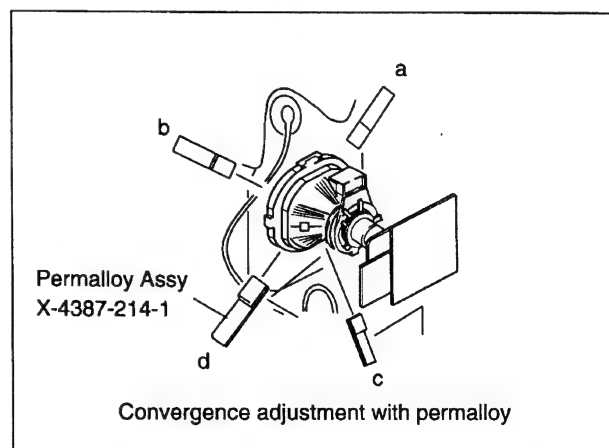
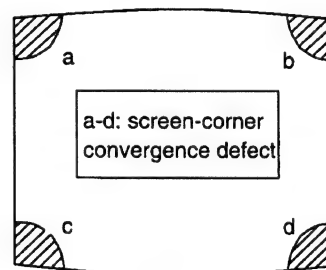
6) C. BOW adjustment at the lower side of the screen (DC 7)



7) TILT adjustment at the lower side of the screen (DC 8)

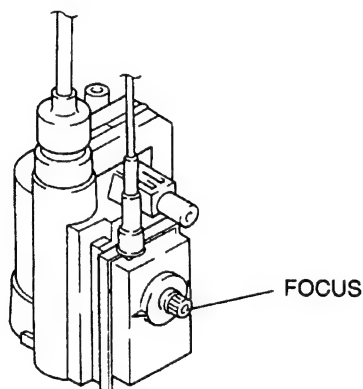


4. If you cannot adjust corner convergence properly, correct them with permalloy.



3-3. Focus

1. Receive a television broadcast.
2. Normalize the picture setting.
3. Adjust the focus control on the flyback transformer to become the focus in the center area properly.
Bring only the center area of the screen into focus, the magenta-ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.



3-4. Screen (G2), White balance (Adjustment on the service mode with remote control)

G2 adjustment (RV702)

1. Normalize the picture and brightness setting.
2. After setting the service mode, a digital voltmeter connects to cathode (KR).
3. Choose the service item VP17 (G2-SW) with the push button **1** or **4** on the remote control.
4. Choose the service item VP18 (G2-ADJ) pressing the push button **1** once on the remote control, adjust the cathode voltage to $175.0 \pm 3.0\text{VDCV}$ with the push button **3** or **6**.
5. Adjust RV702 (G2) before disappearance the raster on the screen.

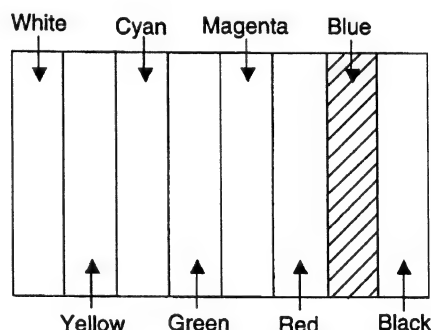
Notes:

- If the service item VP17 (G2-SW) with the push button "1" is chosen, You cannot see an item number and a data character because a screen cuts off.
If the service item VP18 (G2-ADJ) is chosen, be careful that another item is not chosen.
- With the service item VP18 (G2-ADJ), don't write in.

White balance adjustment

Call the item number VP(YCJ)19-22, 26 with the service mode, then carry out the following adjustments in this order.

1. Input colour bars signal with the pattern generator, enter into the service mode.
2. Minimize the picture setting with definition adjustments of menu, then normalize the brightness setting, and then switch the H.white off.
3. Minimize the cut-off green (item number VP21) and the blue (item number VP22) setting, set the drive green (item number VP19) and blue (item number VP20) setting in the central position.
4. Switch the pattern generator signal to full-white.
5. Adjust the white balance optimum at the cut-off of the green and blue.
6. Maximize the picture setting, adjust the drive of the green and blue so that the white balance becomes optimum.
7. Adjust the white balance over again so that the white balance becomes optimum on the picture minimum and picture maximum.
8. Switch the pattern generator signal to colour bars.
9. If the picture minimizes, adjust the brightness correction



(item number VP26) to the dim brightness of the blue stripe on the screen.

10. Normalize the definition adjustment of menu.


SECTION 4

CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied remote commander RM-842.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch of the set. Then press the  button on the remote commander twice.

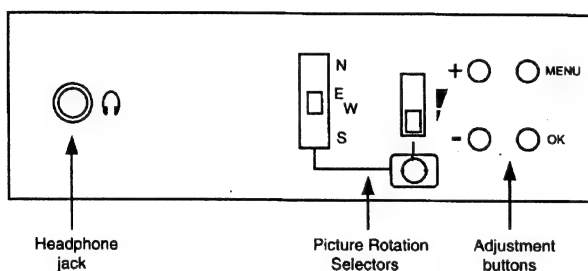


Fig.4-1

2. "TT" will appear at the upper right corner of the screen.

Command operation in service mode.

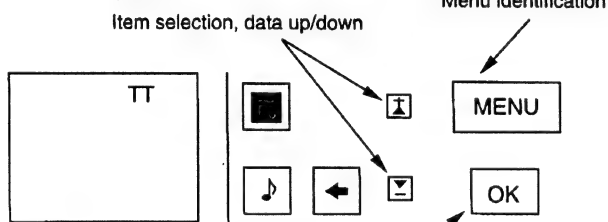




Fig.4-2

Fig.4-3

3. Press the **MENU** button on the remote commander to obtain the menu on the screen.

MAIN MENU	
	Programme Table
	Video Connection
	Screen Mode/PIP
	Preset/Timer
	Picture Control
	Sound Control
	Language
>	DEMO
Select < > and press OK	

Fig.4-4

4. Press the  and  buttons on the remote commander and move > to DEMO.
5. Press **OK** button to proceed to the next menu.
6. The menu of Fig. 4-5 will appear on the screen. Select the DEVICE corresponding to the adjustment item from the table on the next page.

DEVICES	
	INIT TV
>	TDA4686/4780
	ECO 3
	CXD2018Q
	TDA9145
	CXA1526
	TDA6812
	CXA7948a
	PIP
Select < > and press OK	




Fig. 4-5

7. If adjustment item is TDA4780, press the  button and move > to TDA4780.

TDA4780

Item No.	Adjustment item	Data Amount
1	BRIGHT	31
2	COLOR	31
3	PICT	52
4	HUE	31
5	R GAIN	41
6	G GAIN	38
7	B GAIN	31
8	R LEVEL REF	31
9	G LEVEL REF	31
10	B LEVEL REF	31
11	PEAK DRV LIMIT	36
12	GAMMA	31
13	SANDCASTLE 2 LEVEL-5	ON
14	DELOF	OFF
15	DATA BUFFER	OFF

Select   and press OK.

8. Press **OK** button to get the next selection menu.
9. Press  button and move > to the adjustment item and press **OK** button.
10. Press  and  buttons to change the data in order to comply with each standard.
11. Press **OK** button to write data.
12. Turn off the power to quit service mode when adjustments are completed.

TDA4780

Item No.	Adjustment item	Data Amount
01	BRIGHT	31
02	COLOR	31
03	PICT	52
04	HUE	31
05	R GAIN	45
06	G GAIN	38
07	B GAIN	31
08	R LEVEL REF	31
09	G LEVEL REF	31
10	B LEVEL REF	31
11	PEAK DRV LIMIT	45
12	GAMMA	31
13	SANDCASTLE 2 LEVEL-5	ON
14	DELOF	OFF
15	DATA BUFFER	OFF
16	NTSC MATRIX	OFF
17	HDTV	OFF
18	FSBL	OFF
19	AUTO CUT OFF	ON
20	FSW 2 DISABLE	OFF
21	FSW 2	OFF
22	FSW 1 DISABLE	OFF
23	FSW 1	OFF
24	ADAPTIVE BLACK	ON
25	Y HIGH 1V	OFF
26	MOD 2	OFF
27	BLUE STRETCH	ON
28	VM OUT	ON
29	PEAK DRV ABSOLUTE	ON
30	TIME CNST PEAK LIMIT	OFF
31	No selection	OFF
32	SUB BRIGHT	-5
33	SUB COLOR	0

CXD2018Q

Item No.	Adjustment item	Data Amount
01	V SIZE	ADJ.
02	V SHIFT	ADJ.
03	S CORRECTION	ADJ.
04	V LINEARITY	ADJ.
05	H SIZE	ADJ.
06	PIN AMP	ADJ.
07	TILT	ADJ.
08	UPPER CORNER	ADJ.
09	LOWER CORNER	ADJ.
10	V BOW	ADJ.
11	ANGLE	ADJ.
12	HV COMP. V	13
13	HV COMP. H	8
14	FRAME SHIFT	OFF
15	FREE RUN 60 Hz	OFF
16	SYSTEM 60 Hz	OFF
17	ASPECT WIDE	OFF
18	DOUBLE SCAN	OFF
19	INTERLACE	ON
20	H SHIFT	32

Typical On Screen Display based values when receiving PAL Phillips pattern.

TDA6812	ADJ
Stereo-Separation	(30)

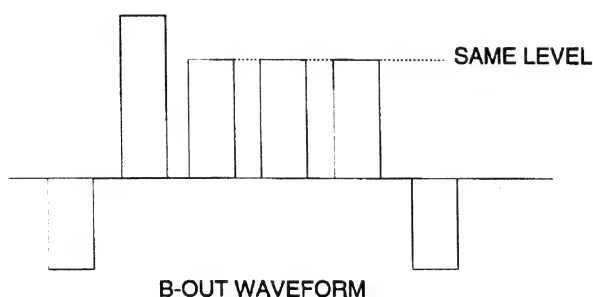
Should be adjusted twice 4 : 3 and 16 : 9 mode.

SUB BRIGHTNESS ADJUSTMENT

1. Input a Phillips pattern.
2. Enter into service mode and press 23.
3. Adjust data so that 0-IRE of grey scale and CUT-OFF 20-IRE are only slightly visible on screen.

SUB COLOR ADJUSTMENT

1. Input a PAL color bar signal.
2. Connect an oscilloscope to pin ③ (B) of CN0403 on the C board.
3. Enter into service mode and press 33 of TDA4780, SUB COLOR.
4. Adjust data so that the right sides of the waveform are at the same level.



STEREO-SEPARATION ADJUSTMENT

1. Input a 1kHz stereo signal to the L-ch and a 400Hz stereo signal to the R-ch.
2. Enter into service mode.
3. Adjust data so that sound is not detected in the Right-ch and the Left-ch.

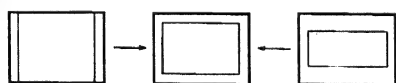
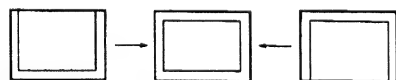
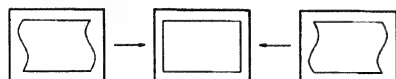
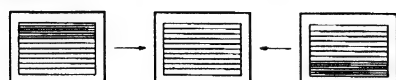
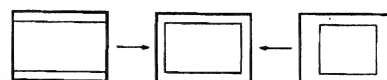
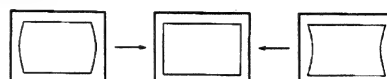
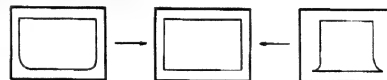
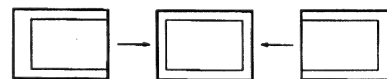
DRIVE AND CUT OFF

See direct test mode list attached and refer to sub brightness or such for adjustment method.

DEFLECTION SYSTEM ADJUSTMENT

1. Enter into service mode and select CXD2018Q.
2. Select and adjust each item in order to obtain the optimum image.

Item No.	Adjustment item	Data Amount
01	V SIZE	ADJ.
02	V SHIFT	ADJ.
03	S CORRECTION	ADJ.
04	V LINEARITY	ADJ.
05	H SIZE	ADJ.
06	PIN AMP	ADJ.
07	TILT	ADJ.
08	UPPER CORNER	ADJ.
09	LOWER CORNER	ADJ.
10	V BOW	ADJ.
11	ANGLE	ADJ.
12	HV COMP.V	13
13	HV COPM.H	8
14	FRAME SHIFT	OFF
15	FREE RUN 60 Hz	OFF
16	SYSTEM 60Hz	OFF
17	ASPECT WIDE	OFF
18	DOUBLE SCAN	OFF
19	INTERLACE	ON
20	H SHIFT	ADJ.

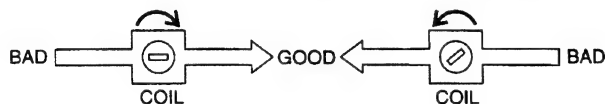
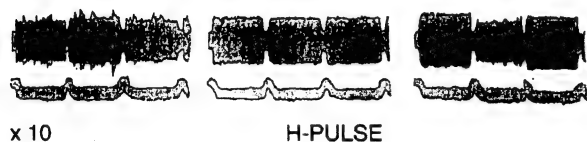
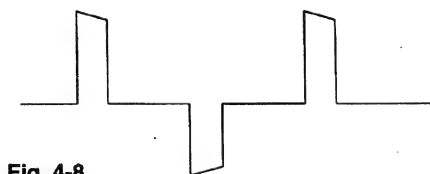
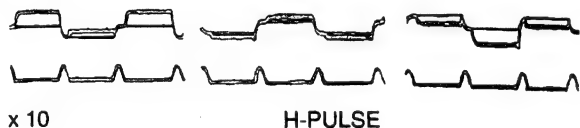
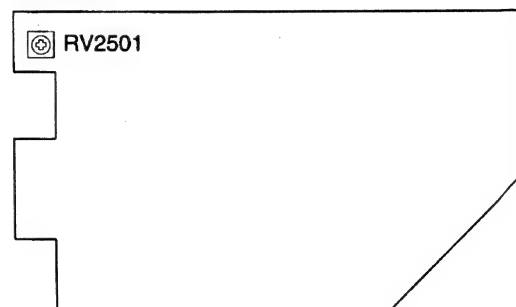
V SIZE**V SHIFT****S CORRECTION****V LINEARITY****H SIZE****PIN AMP****TILT****UPPER CORNER****LOWER CORNER****V BOW****ANGLE****H SHIFT**

3. Press **OK** button to write data.

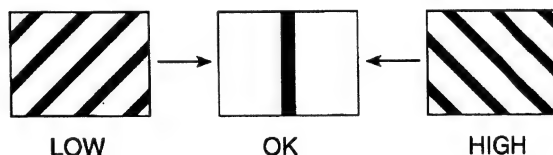
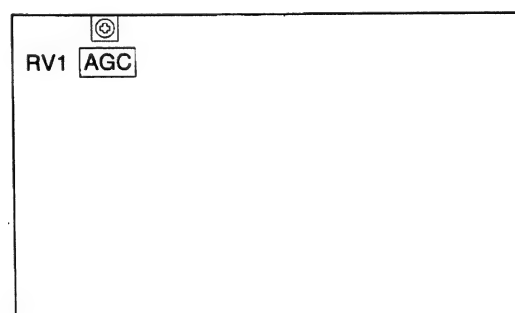
If the menu display prevents accurate adjustment, press to clear, to resume, press once again.

BELL FILTER ADJUSTMENT L3, L2

1. Input a Phillips signal.
2. Connect an oscilloscope to pin ⑮ of IC1 on the A board.
3. Adjust L3 (Bell Filter) to obtain a flat chroma/smooth signal see (Fig 4-6).
4. Connect an oscilloscope to pin ② of IC1 on the A board.
5. Adjust L2 (B-Y) to obtain symmetrical transient between (R-Y) → (B-Y) and (B-Y) → (R-Y) see (Fig 4-7).
6. Connect oscilloscope to pin ④ of CN0106.
7. Confirm ID flip-flop output signal is as indicated in (Fig 4-8).

Fig. 4-6 < MONITOR PIN ⑮ of IC1 Connect**Fig. 4-7** < MONITOR PIN ② of IC1 Connect**Fig. 4-8****4-2. VOLUME ELECTRICAL ADJUSTMENTS****H-FREQ ADJUSTMENT (RV2501)****D BOARD**

1. Input a Phillips pattern.
2. Add a 100μF 16V capacitor in parallel with R2503, to make a free running condition.
3. Adjust RV2501 to obtain frequency of 31.25Hz ± 50Hz.

**AGC ADJUSTMENT (IF BLOCK)**

1. Receive an off-air signal.
2. Adjust the AGC RV1 so that there is no snow noise or cross-modulation visible on the screen.
3. Change the receiving channel and confirm status.

4-3. TEST MODE 2 :

Is available by pressing Test button twice, OSD "TT" appears. The functions described below are available by pressing the two numbers. To release the Test Mode 2, press 0, 10, or 20 twice ... or switch the TV into Stand-by Mode. Pressing the two local controls (+ and -) during Power ON will also switch into "TT" mode.

In TT mode, it is possible to remove the menu from the screen by pressing the Speaker OFF button. By pressing the Speaker OFF button a second time the menu will reappear. The function is kept even when the menu is not displayed !!.

00	Switch TV back into normal mode - TT mode off
01	Direct access to Picture maximum
02	Direct access to Picture minimum
03	Set the Volume to 35% (Production request)
04	Set the Volume to 50% (Production request)
05	Set the Volume to 65% (Production request)
06	Set the Volume to 80% (Production request)
07	No function
08	Shipping Condition (Production request) To ensure that all TV sets leave the Production facility with the same presettings. Programme 1 is selected, AV IN is set to AV1, AV OUT is set to TV Out, Volume and HP volume is set to 35%. Resolution is set to high, Format is set to 4:3, Pip is set to Top Left position, Pip is switched off, TT mode is switched off, all analogue values are set to the reset setting (factory setting).
09	Language reset (Production request) With this function the "Language Byte" in the NVM (Bank 0AAH Address 0DCH) is erased (set to 0FFH). The Lanuguage Menu appears now automatically when the TV set is switched ON, as long as no new language is selected.
10	The TT number will be deleted. All numbers with 0 (10, 20, 30, 40) will reset the TT number. A new number can be selected. TT display is kept.
11	Direct access to Balance (Production request) With Cursor Up/Down the Balance can be controlled (w/o OSD, Menu display).
12	Direct access to Hue (Production request) With Cursor Up/Down the Balance can be controlled (w/o OSD, Menu display).
13	Display of Software Version and TV set configuration.
14	Adjustment of N/S Correction

15	Read factory setting from ROM (Programme Code) and store this data at Last Power Memory data location. (The previous last power memory data is overwritten.) (For Service) AE-2F has 3 pages of Analogue data : <ol style="list-style-type: none"> 1. Last Power Memory data. This data is sent continuously to the corresponding IC's (TDA9145, TDA6812) with this data the TV picture/sound appears. 2. Reset data. By pressing "Reset" in menu this data is transferred from Reset Data location to the Last Power data location in NVM. That means the previous Last Power Memory Data is overwritten by the Reset data. Last Power memory and Reset data are now the same . 3. Factory fixed data. The ROM code of the micro processor contains analogue data which is unable to be changed.
16	Save actual Last Power Memory data at Reset Data location (the previous Reset data is overwritten) (For Service)
15/16	With these two functions , it is possible to preset user defined Reset values (just TT 16) or to preset factory defined Reset values (first TT 15 then TT 16).
17	This function presets the Labels for the AV sources: The Labels are AV1, RGB, AV2, YC2, AV3, VC3, AV4, VC4. (Production request)
18	Text possible On/Off selection of Text (toggle function)
19	Direct access to Stereo Separation. With Cursor Up/Down command the Separation can be adjusted. (no need to select the menu)

20	See TT 10 In the case of TT functions which give the possibility of "Direct access", the adjustment can be done with Cursor Up/Down commands. After releasing the selected TT function by TT 00 or other TT number the adjusted value is stored automatically.
21	No function
22	No function
23	No function
24	No function
25	No function
26	Text Character Set selection Char set 06 -> West Europe (see 9.24 Text Character Set)
27	Text Character Set selection Char set 38 -> East Europe (see 9.24 Text Character Set)
28	Text Character Set selection Char set 40 -> West Europe , US English (see 9.24 Text Character Set)
29	Text Character Set selection Char set 55 -> West Europe , Turkish (see 9.24 Text Character Set)
30	See TT 10
31	Direct access to Red Gain [TDA4780]
32	Direct access to Green Gain [TDA4780]
33	Direct access to Blue Gain [TDA4780]
34	Reserved for TDA4780 Red Level Ref
35	Reserved for TDA4780 Green Level Ref
36	Reserved for TDA4780 Blue Level Ref
37	Direct access to Peak Drive Limit [TDA4780]
38	Direct access to Gamma Level [TDA4780]
39	No function
40	See TT 10
41	TDA4780 is set to default data (almost Center positions)
42	TDA4780 is set to default data (almost Center positions)
43	TDA4780 is set to default data (almost Center positions)
44	EC02 is set to default data
45	Set NVM to Protect mode (Bank 0AEH Adr. 0FFH write with 0)

46	IR Channel Presetting Mode The channel presetting can be done by a Special IR Transmitter. Sequence: TT46 -> --PR Number select display appears Select Prog. No. from where the channels shall be stored. -> Now TV is waiting for IR sequence. <-- -> If no IR transmission starts TT46 is released after 20 sec. <-- ! NOTE: When TT46 is active, any IR transmission will be interpreted as PROG Data!
47	Adjustment of MPIP MultiPIP horizontal position
48	Adjustment of MPIP MultiPIP vertical position After using TT49 a compliter new adjustment is necessary!!
49	The EEPROM Testbyte is erased. After Power OFF -> ON the complete EEPROM data (exept channel tables) are overwritten. EEPROM Protection Byte is set to 0 - protection mode.

Note :

For No. 35/36/37/38 special pressing (AKB, forced Color Mode, Trap) is selected.

After selecting a new Test Mode Number, the AKB is switched ON, the Trap is switched On and TDA9145 is switched to Auto Search Mode.

Note :

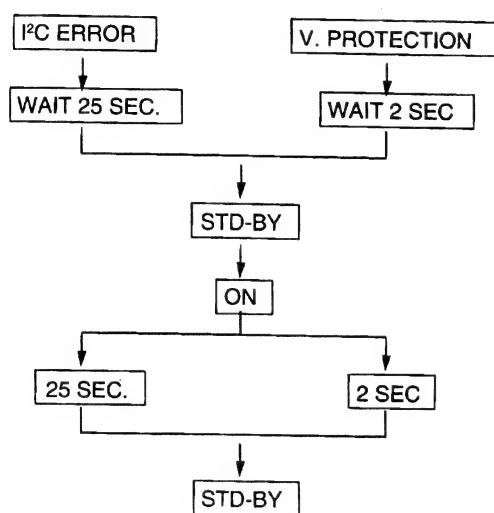
Functions TT 41/42/43/44 are only available when PR 99 is selected, to avoid inadvertent usage. These functions overwrite the complete data package for the selected IC in the EEPROM. After using one of these functions a complete new adjustment of the selected IC is necessary .

In Test Mode 2 the Menu display is switchable by the Speaker-Off button.

4-4. ERROR MESSAGE

Self diagnostic system operates as follows.

- When the microprocessor is unable to receive an acknowledgement back from the device, the LED starts flashing according to the table below.



In the case of more than one error in parallel, the blinking error shows max priority according to the error number (e.g. error 2 and error 5 appear together, then LED,s show error 2).

ERROR TABLE

ERROR COUNT	IC TYPE	FUNCTION
1	I I C BUS	SDA low
2	NVM	EEPROM
3	SDA3202	Tuner PII
4	TDA9145	Colour decoder
5	TDA4870	RGB/Jungle
6	TDA6812	Sound processor
7	CXD2018Q	V deflection
8	CXA1855S	AV switch
11	SDA5273P	Text
13		V protection

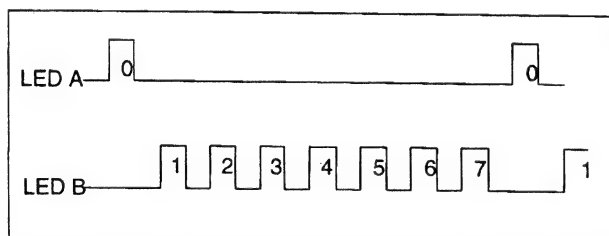
Stand By LED blinking

No I K return

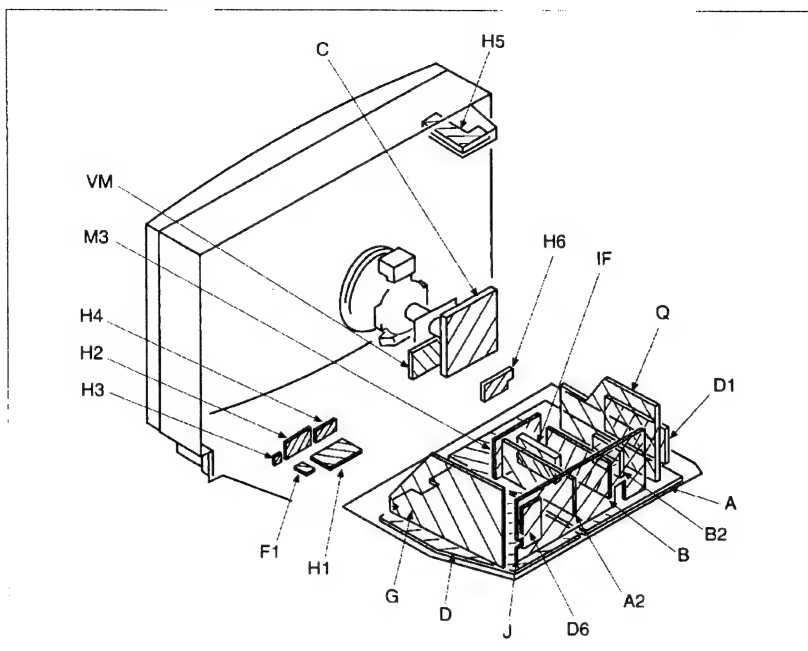
4-5. ERROR I²C BUS DIAGNOSTIC SYSTEM FOR AE-2F CHASSIS.

For all IC's used in the AE-2F chassis which are necessary to obtain picture and sound there is an inbuilt I²C Bus diagnostic system.

In the case of no acknowledge bit, LED A and LED B start blinking as shown.



5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm

Rating electrical power $\frac{1}{4}$ W

- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- \perp : earth - ground.
- /// : earth - chassis.
- $\#$: no mounted.

Note : The components identified by shading and marked \uparrow are critical for safety. Replace only with the part number specified.

Note : Les composants identifiés par une trame et par une marque \uparrow sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié.

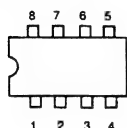
Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE
	: FUSE	NONFLAMMABLE
	: RS	NONFLAMMABLE
	: RB	NONFLAMMABLE
	: RW	NONFLAMMABLE
	: \times	ADJUSTABLE RES
	: LF-8L	MICRO INDUCTOR
	: TA	TANTALUM
CAPACITOR	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLY
	: MPP	METALIZED POLY
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

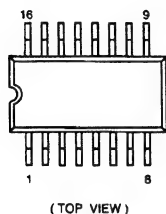
- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M Ω digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal product tolerances.
- All voltages are in V.
- Circled numbers are waveform references
- : B+ bus.
- : signal path. (RF)

SEMICONDUCTORS

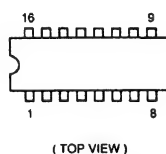
BA4558
LM393P
MC44144P
M5216P
ST24C16CB1
TDA2822M
TEA2114
 μ PC393C
 μ PC4558C



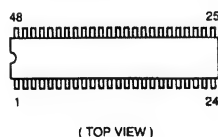
CXA1315M



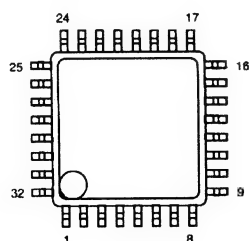
CXA1526P
HEF4046BT
MC14046BDWR2
MC14053BCP
MC33025P
MC74HC4053N
TDA4510/V8
TDA4665T
YM7128
 μ PD4053BC



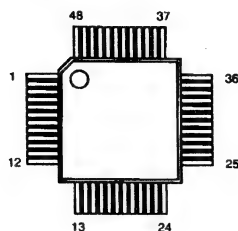
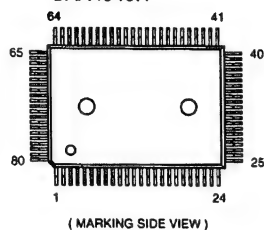
CXA1855S



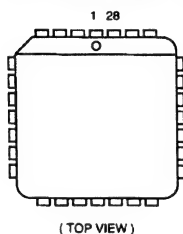
CXD1176Q



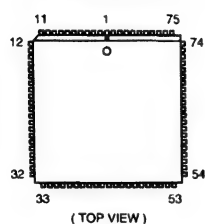
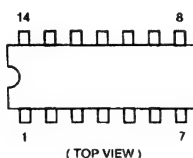
CXD2018Q

CXD2024AQ
SAA4940H

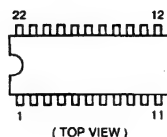
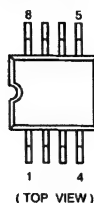
CY7C291A-25JC/PLS01



EPM7128LC84-20TP

IR2112
LM324N
TDA6130-5X4GEG

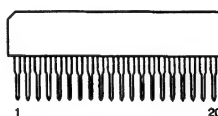
LA7856A

LM358D
TL7705CPS-B

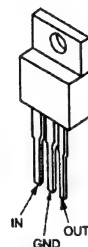
LM78L05ACZ
L78L08ACZ-AP
MC78L05ACPRP
NJM78L05A



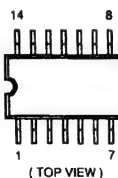
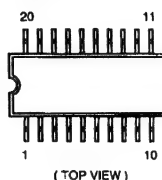
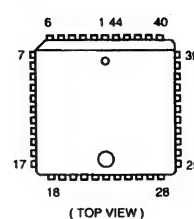
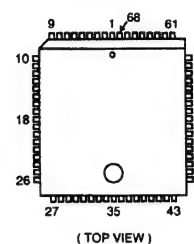
MB81C4256A-70PSZG



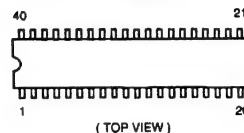
MCT7809CT
NJM78M09FA
NJM7812FA



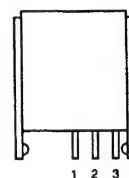
MC74F08DR2
MC74F86M
MC74HC00AF

MC74F244M
74F541SJSAA4951WP/V1
S87C652-4A44SAA7158WP
SDA5273P-C26-GEG

SAA7282-ZP

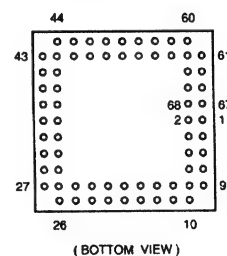
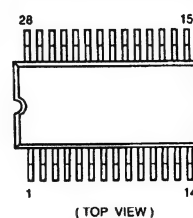


SBX1617-51

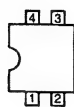


1. VCC
2. VOUT
3. GND

SDA30C163-2GEG

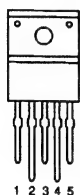
SDA9187-2XGEG
SDA9188-3XPGE

SFH617G-1



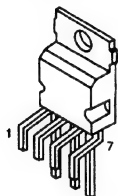
1. VCC
2. NC
3. Vout
4. GND

SI-3050CA
SI-3090CA
SI-3120CA

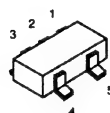


1. GND
2. Vo (ON/OFF)
3. Vo
4. Vo SENSE
5. Vin

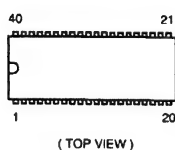
STV9379
TDA2052



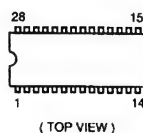
TC4S66F



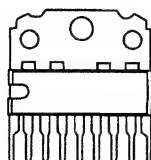
TDA2579B



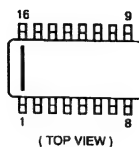
TDA4650/V4
TDA4780/J3



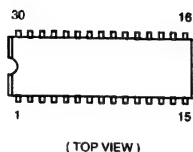
TDA6111Q



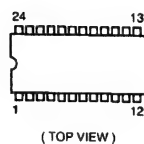
TDA6812-2



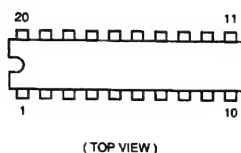
TDA7317



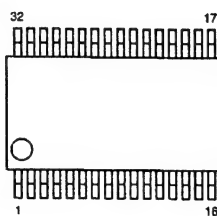
TDA8443B
TDA9145/N2B



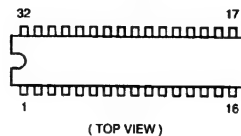
TDA8732



TDA8755T



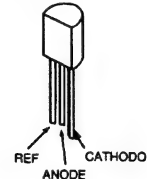
TDA9160A



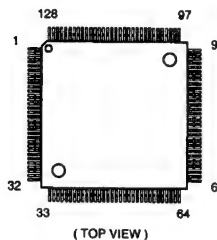
TEA7605



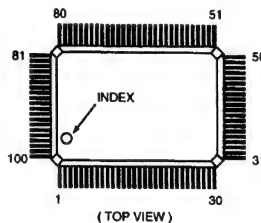
TL431CLP



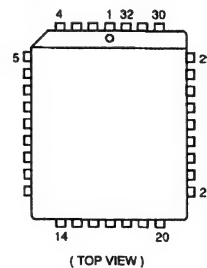
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TMC57110-D77515PB



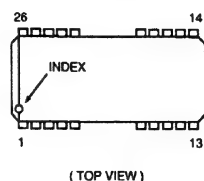
TMC57120-D77516PJ



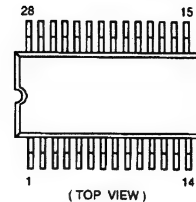
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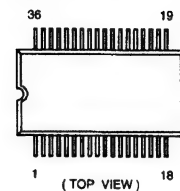
TMS4C1060B-30DJ



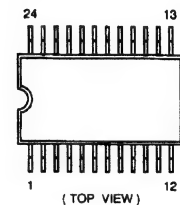
TMS4C1081-60DGR



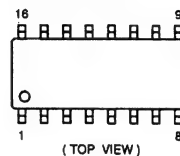
TMS4C2970



μPD42102G-3



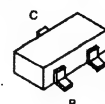
74F157ASJ



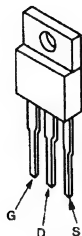
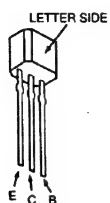
BF199
JC501
2SA1837
2SC2551-O
2SD788



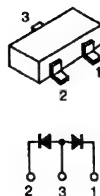
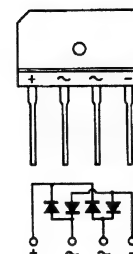
BF550
DTA114EK
DTA114TK
DTA144EK
DTA144TK
DTC114EK
DTC124EK
DTC144EK
2SA1037K
2SA1162-G
2SC2412K
2SC2413K



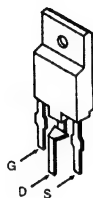
IRFIBC40

2SC2785-HFE
2SC3311A

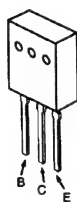
DAP202K

D4SB60L
RBA-402L
RBA-404B
RBA-406B

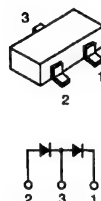
IRFI740G



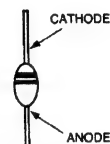
2SC3997CA



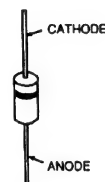
DA204K



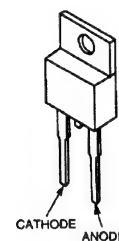
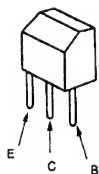
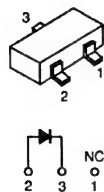
ERC38-06

IRF614
2SK940

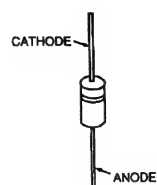
2SC4793

D1NL20
EGP10D
EGP20G
EL1Z
GP08D
RGP02
RGP10G
RGP15G
1SS83

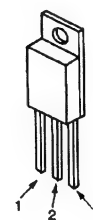
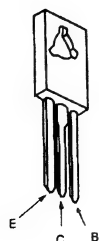
ERD08M-15

2SB733
2SB734
2SC3733
2SD774BAS16
BBY40
MA3039H
MA3056H
MA3056M
MA3068
RD5.6M-B2

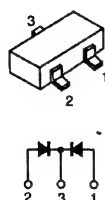
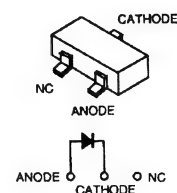
D1N20R	MTZJ-15B
EGP10G	MTZJ-18B
ERA38-06	MTZJ-33C
ERA81-004	MTZJ-36B
ERA83-006	MTZJ-39C
MTZJ-2.2A	RD3.9ESB2
MTZJ-3.6A	RD5.1ESB2
MTZJ-5.1B	RD5.6ESB2
MTZJ-5.6B	RD6.8ESB2
MTZJ-6.8B	RD7.5ESB2
MTZJ-7.5A	RD15ESB2
MTZJ-9.1	RD18ESB2
MTZJ-9.1A	1SS119
MTZJ-13B	1SS133



ESAD39M-06C

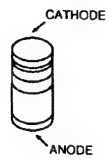
2SC2688-LK
2SC3840K

DAN202K

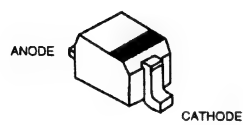
MA3027H
MA3030H

KV-W321

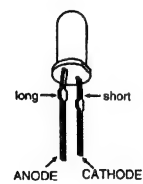
MA3051L



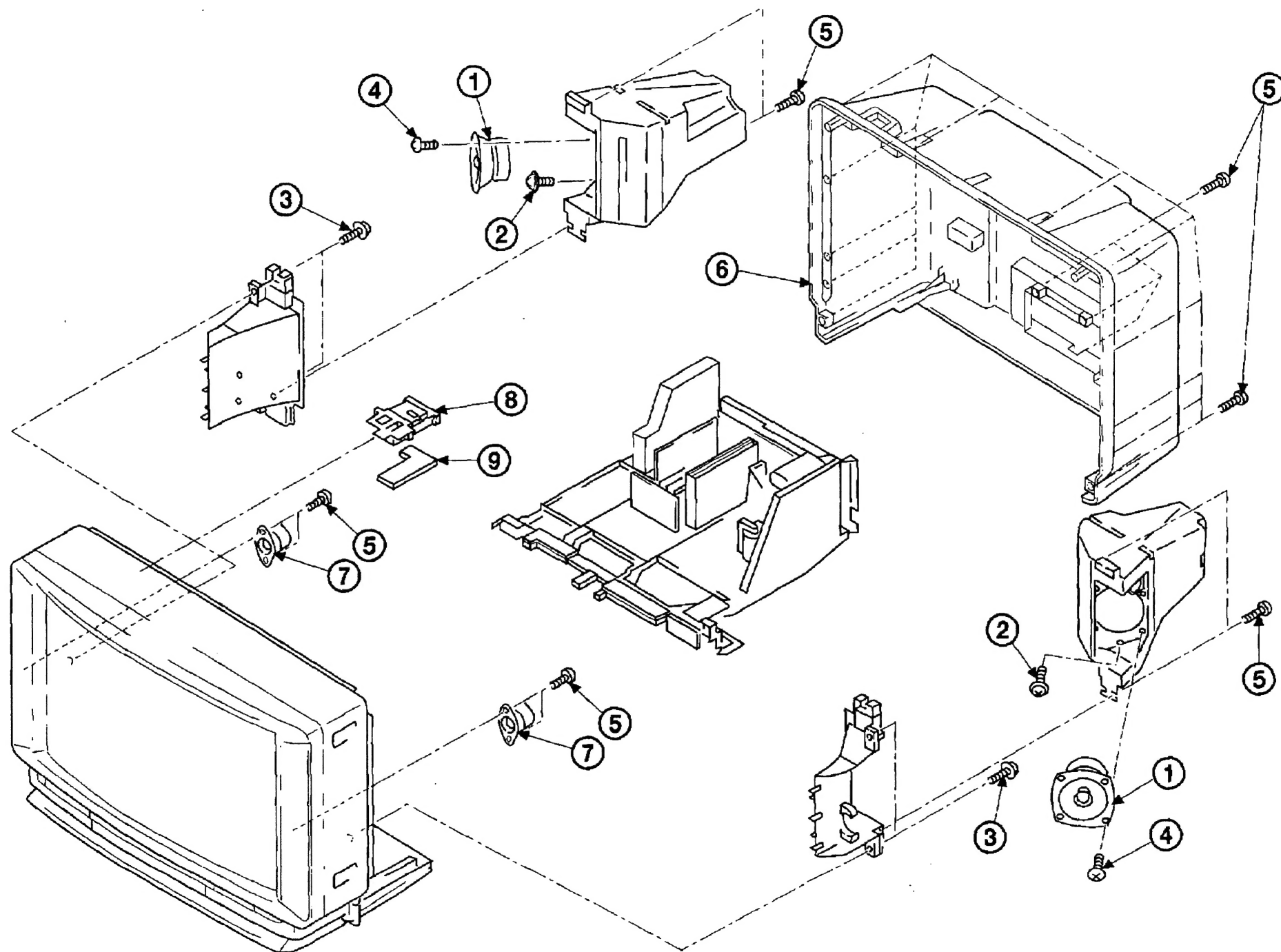
1SV214
1SV217



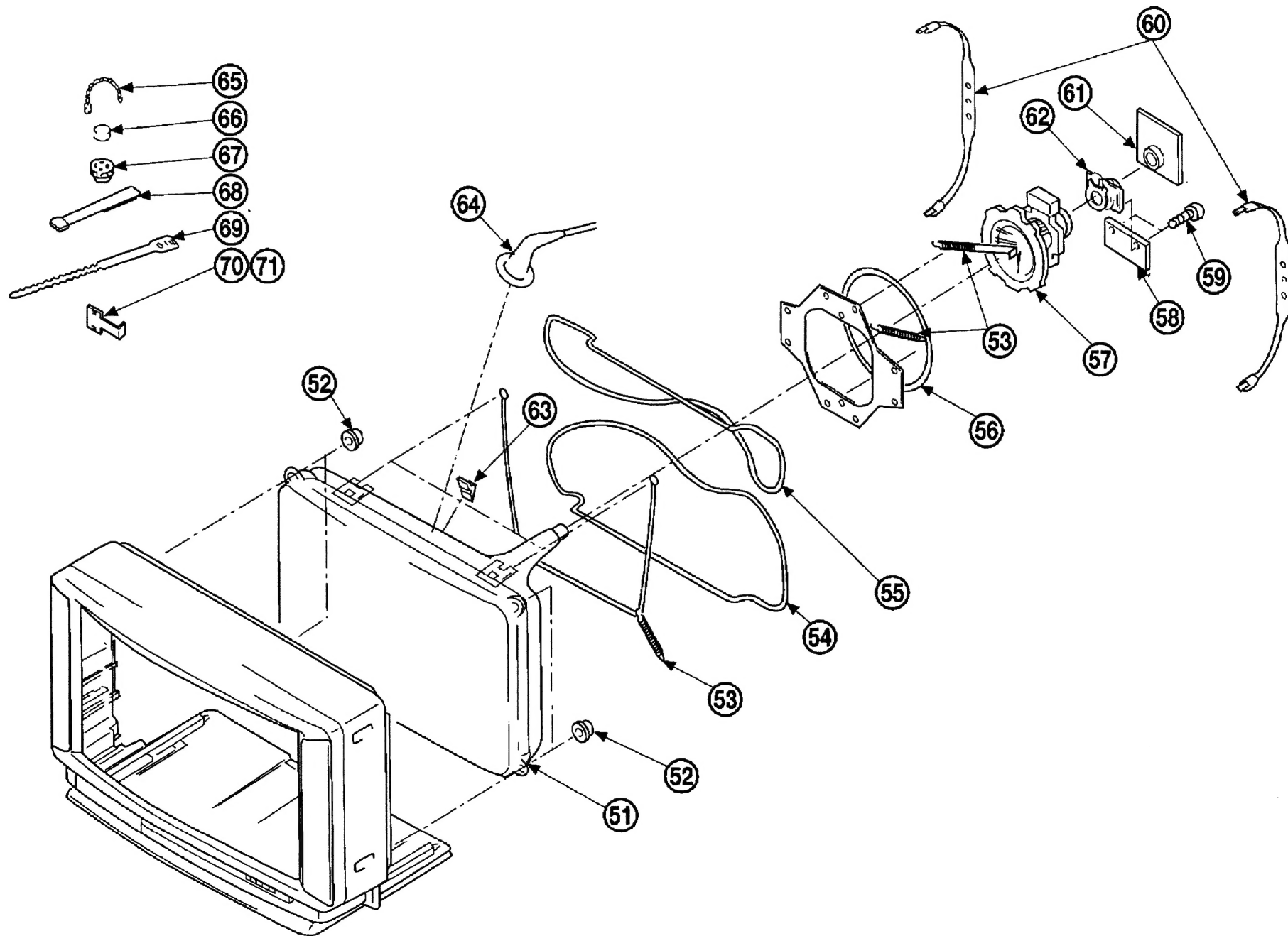
TLG124A
TLR124
TLY124



6-1. REAR COVER AND SPEAKER

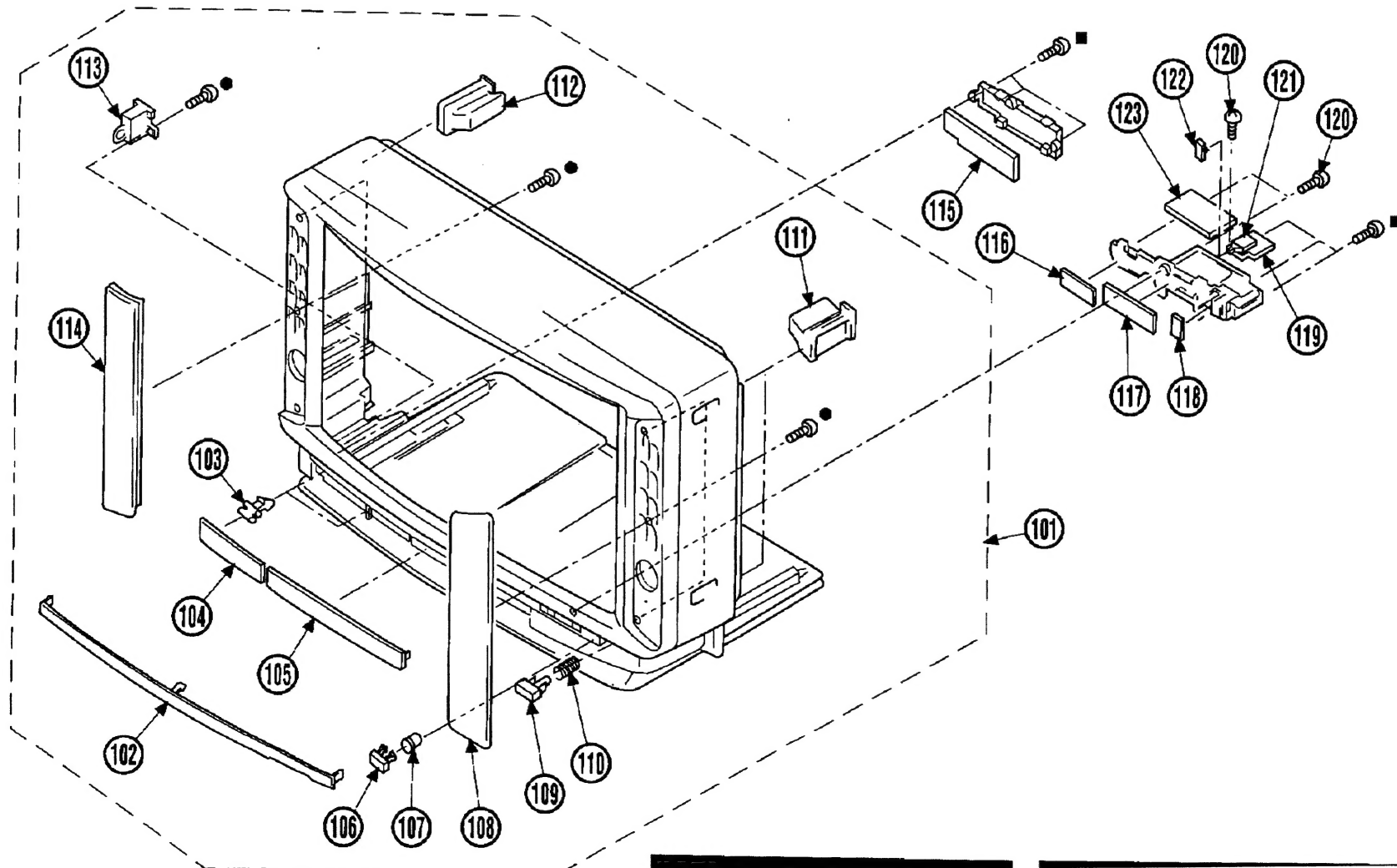


6-2. PICTURE TUBE

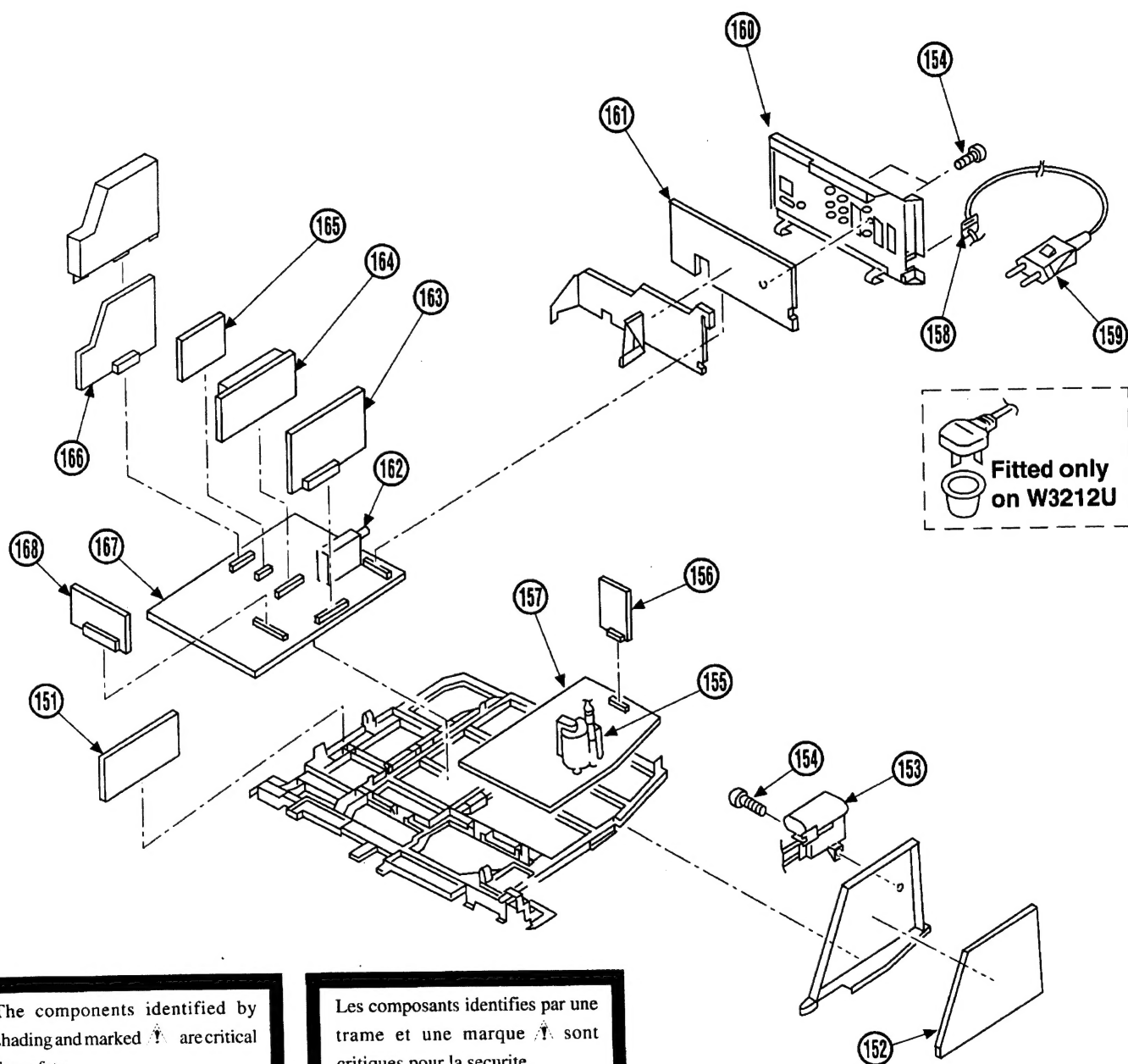



6-3. BEZEL


- : 7-685-663-79 BVTP 4 x 16
■ : 7-685-152-19 BVTP 3 x 25



6-4. CHASSIS



The components identified by shading and marked  are critical for safety. Replace only with the part number specified.

Les composants identifiés par une trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.